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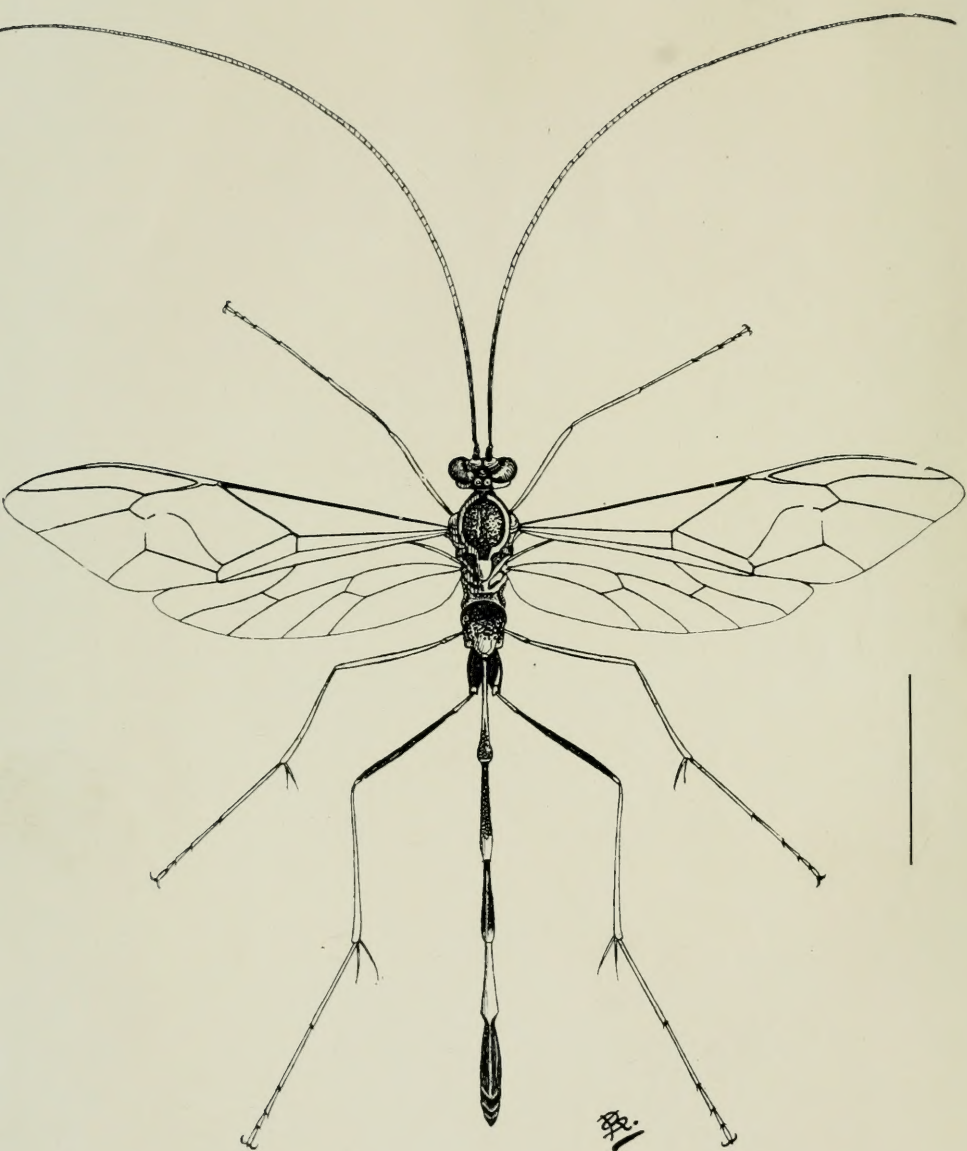
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Ichneumonologia Britannica, v.

THE

ICHNEUMONS OF GREAT BRITAIN

A DESCRIPTIVE ACCOUNT OF THE FAMILIES, GENERA AND SPECIES
INDIGENOUS TO THE BRITISH ISLES, TOGETHER WITH NOTES AS TO
CLASSIFICATION, LOCALITIES, HABITATS, HOSTS, ETC.

BY

CLAUDE MORLEY, F.E.S., F.Z.S.

Membre Soc. Ent. de France,
Deutsche Ent. Gessellschafte, etc.

OPHIONINAE.

Finis creationis telluris est gloria Dei ex opere naturae per hominem solum.—LINN.

THE AUTHOR IS GREATLY INDEBTED TO
RUPERT STENTON, ESQ., F.E.S., FOR THE
VERY EXCELLENT FIGURES IN THIS VOLUME

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PREFACE.

Ten years to-day I sat writing the Preface to the first volume of this work, and the time since expended upon the subsequent volumes has indeed been very pleasant, yielding much happiness of Plato's "idea eidos"; for there are few experiences more personally pleasing than to turn wrong into right or bring order out of chaos. Would that I could believe, with the Ven. William Kirby, "finis coronat opus," that the last volume transcended its predecessors; but the animals here treated of are so elusive in their structural stability, and so protean both in their sexual characters and colour, that it were something to feel conviction—as certainly I do feel it—that they are now reduced to a more natural order and sequence than has hitherto been attained, especially in this country where the subject has heretofore attracted so little attention that, from the days of Westwood, the most careful thinkers have discovered too few data on which to found biological theses upon Ichneumonidae. This lack of data, or rather the wide range of books and periodicals through which the known data were scattered, has now, I trust, been obviated by the concentration I have attempted throughout the work of every published or personally ascertained fact with regard to each species. All the details of distribution, life-history, and association *inter se* are here; but I shall not attempt to elucidate the many fascinating problems they present in a mere Descriptive Account of indigenous insects, for in them the collector and systematist must give precedence to the biologist and philosopher; and as we, the former, have attained to Plato's ideal, so they, the latter, will reach on to that infinitely higher one, Aristotle's "intellectual happiness," reserved for so few.

When I first attacked the subject it was with much the feeling that caused Blucher to exclaim upon London, "What a city to sack"; and it has indeed been decimated and rebuilt:—in 1850 but little more than seven hundred species were known in Britain, in 1872 the number totalled just under one thousand two hundred, and I was enabled to record one thousand seven hundred and nineteen different kinds in 1901. Many of these names are now proved to have been erroneously introduced and the true and critical total, according to my Catalogue suffixed to this volume, stands at one thousand five hundred and seventeen distinct

species inhabiting these Islands, or fully one-tenth of the British insects. That the Ichneumonidae are very much more abundant both in species and individuals in the Holarctic than in any other region is now well authenticated; but it appears by no means improbable that the Rev. T. A. Marshall's tentative computation of seven hundred and ten thousand existing species will be fulfilled when this group has been adequately investigated throughout "the whole Palæarctic Fauna, of which that of the British Isles is only a half-starved fragment,"* and elsewhere.

For the last time, and with regret, I here take the opportunity of expressing the acknowledgment of my very great indebtedness to those Entomologists who have so materially assisted me in the accomplishment of my self-imposed task; and I have not the least hesitation in asserting that any measure of success it may have achieved in the way of confirming doubtfully indigenous species and adding its quota to our knowledge of their economy is very largely due to the most ready help I have invariably received from both the following breeders of Lepidoptera and pains-taking collectors of Insects. I thank:—Lady Robinson, Miss Chawner, Mrs. Cowl, Mrs. Holmes, Rev. C. D. Ash, F. C. Adams, W. H. Andrews, E. A. Atmore, A. Bacot, E. R. Bankes, E. G. Bayford, M. Beathe, the late Alfred Beaumont, E. C. Bedwell, Rev. M. C. H. Bird, the late G. C. Bignell, K. Blair, Rev. E. N. Bloomfield, F. Bouskell, R. C. Bradley, the late John Brooks Bridgman, E. Brunetti, Edward Buckell, E. A. Butler, J. E. Campbell-Taylor, Prof. J. W. Carr, Dr. R. T. Cassal, Dr. T. A. Chapman, H. J. Charbonnier, the late A. J. Chitty, G. W. Clutten, W. M. Christy, Dr. E. A. Cockayne, H. Crowther, the late W. Cross, W. P. Curtis, the late C. W. Dale, A. Adie Dalglish, W. B. Davis, H. St. J. Donisthorpe, J. Hartley Durrant, Stanley Edwards, Willoughby Ellis, W. W. Esam, W. Evans, the late E. A. Fitch, T. B. Fletcher, P. de la Garde, J. de Gaulle, the late W. Garneys, C. T. Gimmingham, Edward Goodwin, Rev. H. S. Gorham, J. C. Haggart, C. R. Haines, J. N. Halbert, A. H. Hamm, Ray Hardy, F. C. Hinde, Prof. Selwyn Image, O. E. Janson, Rev. W. F. Johnson, J. W. Kaye, S. W. Kemp, J. H. Keys, the late A. W. Luff, G. T. Lyle, Dr. McDougall, Hugh Main, J. R. Malloch, W. Mansbridge, the late Rev. T. A. Marshall, A. H. Martineau, the late Dr. P. B. Mason, G. W. Mason, R. S. Mitford, A. M. Montgomery, Frank Morey, Rev. F. D. Morice, C. H. Mortimer, J. F. Musham, E. A. Newbery, Dr. G. W. Nicholson, F. Norgate, Col. C. G. Nurse, W. Ollis, G. W. Ord, W. Parkes, F. H. Peachell, Stephen Pegler, K. Pfankuch, the late Albert Piffard, E. W. Platten, G. T. Porritt, R. M. Prideaux, Edward Ransom, Carleton Rea, N. M. Richardson,

* H. W. Bates, Presidential address, Ent. Soc., 1879.

W. Denison Roebuck, the late W. A. Rolleson, G. B. Routledge, the late Edward Saunders, Eric Shaw, Alfred Sich, W. F. Sladen, W. Slater, L. Smith, C. A. L. Smits van Burgst, R. Burgess Sopp, R. South, F. W. Sowerby, the late E. G. J. Sparke, Dr. S. B. Stedman, W. B. Thornhill, Rev. Alfred Thornley, J. R. le B. Tomlin, A. E. Tonge, W. H. Tuck, J. C. Wainwright, Rev. J. Waterston, the late C. J. Watkins, W. E. Wattam, F. J. Whittle, J. Wiggin, C. B. Williams, H. Wood, Col. J. W. Yerbury. To Ernest A. Elliott, F.Z.S., I owe not only the inception and completion of the work, as I stated ten years ago, but the conviction that without his steady and unwearying assistance in its every branch the present volumes could never have attained whatever degree of perfection may be allotted to them.

I leave you with Stephen Stone's assurance (*The Naturalist*, iv, p. 11) that "Whether we reflect on the infinite wisdom which the Almighty has displayed in the ordinary provision He has made for keeping within due limits the different classes of beings He has formed, of which the habits and economy of the *Ichneumonidae* afford us a familiar example; or whether we consider His infinite goodness in a like provision for the preservation of each particular species, which to the observer of Nature will in a thousand ways manifest itself; we shall scarcely fail to find awakened within us feelings of a holy devotion, of fervent piety, and of the highest adoration of Him who, although He inhabiteth Eternity, though His dwelling-place is in the highest Heaven, yet condescendeth to provide for the life and enjoyment of the meanest creature upon earth—of Him who

"Gives the lustre to an insect's wing,
And wheels His throne upon the rolling worlds"

or, as Professor Peck has it: *Eminet in minimus maximus ipse Deus*.

CLAUDE MORLEY.

MONKS' SOHAM HOUSE, SUFFOLK.

May 1st, 1913.

AUTHORS CONSULTED.

[*Cf.* *Ichn. Brit.*, vol. i, p. xvii; vol. ii, p. viii; vol. iii, p. viii; vol. iv, p. viii. As especially relating to the present volume, the following may be quoted.]

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SUB-FAMILY

OPHIONINAE.

Here, no less than in the Tryphoninae, are congregated several entirely distinct groups of insects having all manner of diversified economy and treated of under a common head solely for the sake of convenience, for in every case the abdomen is laterally compressed at least towards its apex, and the alar areolet is never pentagonal as in the Ichneumoninae and the Cryptinae. To the latter Sub-family the present is related in the almost invariably exerted female terebra, which character will distinguish Ophioninae from Tryphoninae in that sex (though many males are very similar, except in the petiolate abdomen of the former) while allying them to the Pimplinae where the abdomen is almost invariably deplanate and not compressed. The following tribes are, for the most part, recognisable at a glance in the perfect state, and such meagre details of their ecdysis as are available go to show that the earlier stages are not more similar: some spin cocoons for their pupal state, some pass it in the bodies of their victims; some are external and some internal direct parasites, while others are injurious hyperparasites, destroying their fellow parasitic Hymenoptera. I place the Ophioninae at the end of the Ichneumonidae because certain Typhoninae are much too closely related to Pimplinae to be far separated therefrom, and the latter again run on almost imperceptibly from the Cryptinae. The Plectiscides might be placed in either the present Subfamily or the Tryphoninae, for they are a heterogeneous group, parts of which bear not only the characters of both but are hardly distinguishable from *Acrodactyla* of the Pimplinae. At the end of all come the Mesochorides whose areolet is unique among Ichneumonidae and whose body-structure is so closely allied (at least superficially) to the Meteorides as to render them a natural link between Ichneumonidae and Braconidae.

Table of Tribes.

- | | | |
|-------|--|----------------|
| (16). | 1. Areolet not obliquely quadrate; abdomen more or less strongly compressed. | |
| (15). | 2. External radial abscissa basally angled at junction with submarginal nervure. | |
| (14). | 3. Second recurrent nervure emitted beyond first submarginal nervure. | |
| (13). | 4. Hind tarsi not spatuliform, nor metathorax apically produced. | |
| (12). | 5. Hind femora mutic, with no trace of central tooth beneath. | |
| (11). | 6. Stigma and radial cell very broad, with the latter short. | |
| (9). | 7. Submarginal nervure usually distinct; median of hind wing basally strong. | |
| (10). | 8. Clypeus convex and compressed; hind tibiae incrassate | PLECTISCIDES. |
| (7). | 9. Submarginal nervure obsolete; median nervure basally pellucid | PORIZONIDES. |
| (8). | 10. Clypeus neither convex nor compressed; hind tibiae slender | CREMASTIDES. |
| (6). | 11. Stigma and radial cell both narrow and elongate | CAMPOPLEGIDES. |
| (5). | 12. Hind femora very distinctly dentate centrally beneath | PRISTOMERIDES. |
| (4). | 13. Hind tarsi spatuliform; metathorax apically produced | ANOMALIDES. |
| (3). | 14. Second recurrent nervure emitted before the submarginal | OPHIONIDES. |
| (2). | 15. External radius continuous with first submarginal nervure | PANISCIDES. |
| (1). | 16. Areolet obliquely quadrate; abdomen not at all compressed | MESOCHORIDES. |

I have considered very carefully the natural association of these Tribes *inter se*, and placed them according to their relative characters. The Porizonides share with the Plectiscides the basally strong median nervure of the hind wing, while differing less in the obsolete intercubital or submarginal nervure (the inner side of the wanting areolet) than in their remarkably broad and short radial cell of the front wings, for in certain of the first Tribe also the submarginal is obsolete. Next comes the group of three Tribes, of which the Campoplegides is bewilderingly numerous and the two before and after it comprise less than a dozen kinds, which might be included with some propriety were it not that the Cremastides bear one or two minor features not found there and the Pristomerides form a very natural link with the Anomalides. This link is less apparent in our Fauna than in Mexico, as I have indicated in my "Revision of the Ichneumonidae," where the somewhat close connection of Anomalides and Ophionides is also commented upon, though in Britain they cannot be mistaken. Here direct association ends, and we find the Paniscides quite distinct from any other Ophionid Tribe except the Mesochorides whose economy, I firmly believe, will eventually replace them in Gravenhorst's original position among the Cryptinae, though there exists an obviously intermediate genus in Australia and India. Nor can we yet be satisfied with the Pimplid connection of the genus *Exetastes* assigned it in my third volume, for the cocoons are identical in every way with those of certain Paniscides, and since 1908 both Dr. Roman and Herr Pfankuch have been good enough to convey their uncertainty upon this point to me, though neither felt justified in more exactly placing that genus.

TRIBE
PLECTISCIDES.

This Tribe is recognised from the remainder of the Ophioninae by having the stigma short and not narrow, the radial cell short and not narrow, with the areolar angle of the radius somewhat acute, though much less so than in the Porizonides; the hind legs not stout and dentate, as in the Pristomerides; the cubital nervure of the hind wing distinct, and not obsolete as in the Porizonides; and the head is nearly always small with clypeus distinctly convex and generally laterally compressed, not deplanate as in the Cremastides.

In general the head small and usually distinctly constricted posteriorly with a strong transcarina between vertex and occiput; eyes not internally emarginate, rarely pubescent; frons not strongly punctate, usually smooth; face parallel-sided, rarely apically constricted, very rarely centrally prominent below scrobes; clypeus always strongly discreted and invariably strongly convex with its sides generally compressed; cheeks very rarely elongate, often sulcate; mandibles weak, apically attenuate with teeth unequal and sometimes obsolete; palpi elongate and slender. Antennae with seventeen to forty joints, the flagellum filiform and pubescent, often very slender; scrobes indistinct or wanting; scape usually subcircular or bulbiform and deeply incised. Thorax high and subcompressed, with notauli often distinct but sternaui obsolete or wanting; metathoracic areae variable in extent, but very rarely complete, areola not infrequently ill-defined, costulae hardly ever present, basal carina of petiolar area nearly always strong and sometimes with apophyses, but occasionally all metathoracic costae wanting; spiracles small and circular; pleurae glabrous and nitidulous, very rarely sculptured. Scutellum normal, rarely apically compressed. Abdomen of variable shape; basal segment usually linear, rarely apically explanate, and rarely distinctly petiolate basally, with spiracles subcentral and discal carinae unusual; second not transversely impressed, though often with strong thyridii; anus generally in ♀ laterally a little compressed; terebra variable in length, as long as body or hardly extending beyond anus, usually about half length of abdomen. Legs usually slender, with coxae elongate, hind tibiae a little incrassate and sometimes either constricted or apically emarginate; calcaria short and slender, the tarsi also always slender with claws simple, not pectinate, rarely large and curved. Wings not small; areolet (1) transversely oblique and distinctly petiolate, (2) with its inner nervure, called the areolar, distinct and the outer wanting, as in Hemiteles, or (3) so utterly wanting that even the inner nervure is obliterated by "radius cum cubito connivens," as Haliday aptly says; basal nervure usually continuous, brachial cell small, lower angle of discoidal usually acute; cubital nervure of lower wing distinct to base and usually strongly curved before the nervellus, which may be straight or geniculate.

The relation of the Plectiscides to the species treated of at the end of the last volume (Ichn. Brit. iv. 315) is so close that Thomson places the genus *Adelognathus* under the present Tribe, from which I consider it sufficiently distinct, both in its structure and Tenthredinid hosts. Schmiedeknecht speaks of Ashmead's reference of this Tribe to the Ophioninae in 1900 as some new thing; to us it has never stood elsewhere, for

Plectiscus was placed next before *Porizon* by Marshall in his 1872 Catalogue and, with *Helictes*, next after *Mesochorus* by Desvignes in 1856. *Helictes*, however, is synonymised in the former catalogue with *Megastylus* and Holmgren is there followed in its certainly erroneous transference to the Tryphoninae. In fact the present group, in reality by no means homogeneous, consists largely of three genera widely separated in the Catalogue: *Plectiscus* among the Ophioninae, *Megastylus* among the Tryphoninae, and *Clepticus*, with which I have succeeded in satisfactorily synonymising *Proclitus*, among the Xoridides, with which it has no relation. In the last European work upon this Tribe we find here included *Adelognathus*, *Phidias* and *Acrodactyla*, which I have already treated of in former volumes.

Some of the older descriptions are too vague to place in the highly specialised genera now adopted, and I have had to entirely omit both the central European *Plectiscus flavopictus*, Grav. (I.E. ii. 983), which was thought by Förster (in his "Uebersicht der Gattungen und Arten der Familie der Plectiscoiden," 1871, p. 103) to belong to his genus *Myriarthrus*, both for lack of its true position and evidence of indigenous occurrence; and the German *Plectiscus impurator*, Grav. (I.E. ii. 982), thought to be an *Helictes* by Haliday (in his paper on "New British Insects indicated in Mr. Curtis's Guide," p. 115) in 1839, to be the type of his Orthocentrid genus *Blephoctonus* by Förster in 1871 and to probably be *Megastylus pumilio* by Thomson (in his admirable "Försök till gruppering af slägtet Plectiscus, Grav.") in 1888. I have tentatively synonymised *P. zonatus* with *P. canaliculatus*, Först., though the compound description doubtless in part belongs to the genus *Proclitus*; the synonymy of *Helictes varius*, apparently allied to *Idioxenus coxalis*, has yet to be worked out; of *P. pallidipes*, Grav., said by Schmiedeknecht (Opusc. Ichn. 2202) to probably be an Hemiteles, I have already treated (Ichn. Brit. iv. 316).

I have adopted all the available genera of this Tribe, both on account of the unusually lucid method in which Förster elaborated them and because so few of our species have yet been recognised that they will eventually become necessary for the convenient grouping of the remaining mass.

Hardly anything is yet ascertained of the economy of this Tribe; its members are said to exclusively prey upon Diptera, mainly of the Nematocerous families *Mycetophilidae* and *Tipulidae*; I have been enabled to confirm the former association; but it is appalling how little we yet know concerning Ichneumonidous economy.

Table of Genera.

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|------|---|----------------------|
| (6). | 1. Front wings with areolet more or less distinct and entire. | |
| (5). | 2. Metathorax with very distinct discal areae. | |
| (4). | 3. Clypeus entirely deplanate throughout | HOLOMERISTUS, Först. |
| (3). | 4. Clypeus convex and laterally subcompressed | PLECTISCUS, Grav. |
| (2). | 5. Metathorax glabrous with no trace of areae | APERILEPTUS, Först. |
| (1). | 6. Wings with no trace of areolet, its inner nervure sometimes wanting. | |

- (16). 7. Head not cubical; face deplanate,
not centrally elevated.
- (11). 8. Metathorax with discal areae distinct
and entire.
- (10). 9. Nervellus of hind wing distinctly gen-
iculate PROLICTUS, *Först*
- (9). 10. Nervellus of hind wing not at all gen-
iculate EUSTERINX, *Först.*
- (8). 11. Metathorax with no, or only indistinct,
discal areae.
- (15). 12. Inner nervure of areolet distinct; ♂
flagellar joints normal.
- (14). 13. Metathorax subelongate, normal and
not constricted MEGASTYLUS, *Schödl.*
- (13). 14. Metathorax short and centrally strong-
ly constricted DICOLUS, *Först.*
- (12). 15. Areolar nervure obsolete; ♂ flagellar
joints emarginate HELICTES, *Hal.*
- (7). 16. Head cubical; face convex, centrally
prominent MIOMERIS, *Först.*

HOLOMERISTUS, *Förster.*

Först. Verh. pr. Rheinl. 1868, p. 171 (?); *Först. l.c.* 1871, p. 80; Thoms. O.E. xii, 1295.

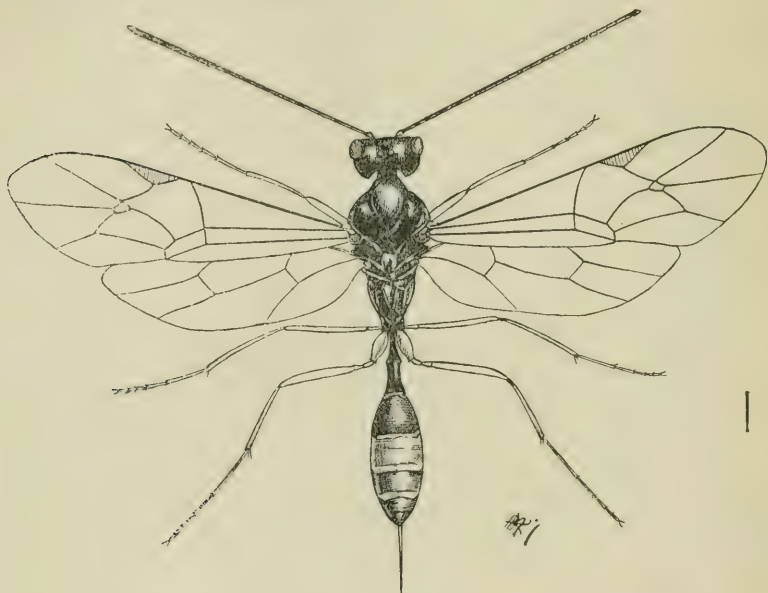
Head of normal size with vertex broad, hardly constricted postëriorly, and discreted from occiput by a distinct costa; eyes not pilose; face parallel-sided and slightly convex; cheeks short and clypeus deeply discreted. Antennae subelongate, with about eighteen joints; scape short and not cylindrical; pedicellus large and extending far beyond scape; flagellum of ♀ apically incrassate, with short and erect but not whorl-like pubescence; basal joint a little longer than second, the apical joint double length of penultimate and distinctly broader. Thoracic notauli deeply impressed and extending to mesonotal disc; metathorax with complete areae, but fine carinae; areola elongate-pentagonal and hardly longer than petiolar area, which does not extend quite to centre; costulae entire. Scutellum somewhat convex. Abdomen not laterally compressed; basal segment linear, with spiracles immediately beyond its centre; second and third finely rugose, with small thyridii; remaining segments smooth; terebra a little longer than basal segment and subreflexed. Legs somewhat slender with onychii small, and calcaria weak and short. Stigma not broad; areolet entire, obliquely quadrate and hardly petiolate; nervellus vertical and not geniculate.

1. *tenuicinctus.* *Först.*

Holomeristus tenuicinctus, *Först.* Verh. pr. Rheinl. 1871, p. 81, ♀; Thoms. O.E. xii, 1296, ♂ ♀.

Head nitidulous and not quite as long as broad, with the mandibles and clypeus rufescent. Antennae broadly fulvescent basally, of ♂ with only the eighth joint distinctly and ninth indistinctly emarginate, of ♀ with sixteen flagellar joints and the apical conspicuously large. Thorax

not dull, with prothorax sometimes rufescent; mesonotum substriate, with basal scutellar fovea very large and deeply impressed; metathorax somewhat short, with basal area distinct and basal carina of petiolar area strong. Scutellum black. Abdomen subfusiform, not elongate and often mainly badius; apical margin of the second to fourth segments somewhat broadly testaceous; basal segment nearly parallel-sided, bicarinate, with distinct tubercles; two basal segments dull and finely aciculate-punctate, the third smoother; gastrocoeli glittering and not small. Legs pale testaceous, with hind tibiae at both extremities and their tarsi piceous; coxae usually pale. Wings with the stigma dull testaceous; basal nervure continuous and second recurrent strongly curved; discoidal cell narrow. Length, $3\frac{2}{3}$ – $4\frac{1}{2}$ mm.



The enlarged apical antennal joint is remarkable. Strobl's female (Mitt. Nat. Ver. Steierm. 1903, p. 118), with twenty-one antennal joints, seems distinct.

Förster knew a single female from about Aix-la-Chapelle in Prussia. and Thomson found both sexes near Helsingborg in southern Sweden. I possess the two females upon the strength of which Bridgman introduced the species as British (Trans. Ent. Soc. 1889, p. 432) and I have drawn the above description from them; they were captured about Shere in Surrey during 1887.

PLECTISCUS, *Gravenhorst.*

Gr. I.E. ii. 978; Först. Verh. pr. Rheinl. 1871, p. 84.

Head not cubical, posteriorly constricted, with base of vertex acutely transcarinate; eyes not pilose; face parallel-sided and the distinctly discreted clypeus laterally somewhat compressed. Antennae seventeen

to twenty-six jointed, with scape somewhat short; flagellar joints elongate, cylindrical and slender, with the first longer than second. Thorax with the mesonotum glabrous and nitidulous, and only apically finely pubescent; notauli wanting or at most only apically distinct; metathoracic areae distinct, though costulae always wanting; spiracular area hardly extending beyond centre. Abdomen with basal segment rugosely punctate, its spiracles almost before centre; terebra distinctly exerted and usually elongate, with valvulae slender and elongately pilose. Legs slender, with onychii and pulvilli small. Areolet oblique, usually entire but if externally obsolete the inner nervure is elongate and distinct; basal radial abscissa strongly curved; parallel nervure emitted from centre of brachial cell; nervellus usually distinctly geniculate and sometimes intercepted.

Table of Species.

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|-------|---|---------------------------------|
| (12). | 1. Petiolar area not extending beyond metathoracic centre, nor terebra longer than abdomen. | |
| (5). | 2. Larger; legs and antennae stout; hind tibiae hardly constricted. | |
| (4). | 3. Anus compressed; propleurae pale; terebra longer than half abdomen | 1. COLLARIS, <i>Grav.</i> |
| (3). | 4. Anus hardly compressed; thorax dark; terebra shorter than half abdomen | 2. EURISTIGMA, <i>Thoms.</i> |
| (2). | 5. Smaller; legs and antennae slender; hind tibiae distinctly constricted. | |
| (9). | 6. Basal segment elongate, linear; body not coarctate. | |
| (8). | 7. Flagellum with nineteen joints; petiolar spiracles strong | 3. TENER, <i>Först.</i> |
| (7). | 8. Flagellum with eighteen joints; petiolar spiracles normal | 4. CANALICULATUS, <i>Först.</i> |
| (6). | 9. Basal segment shorter and broader; body coarctate. | |
| (11). | 10. Hind tibiae infusate; terebra longer than half abdomen | 5. TEREBRATOR, <i>Först.</i> |
| (10). | 11. Hind tibiae pale; terebra shorter than half abdomen | 6. MELANOCERUS, <i>Först.</i> |
| (1). | 12. Petiolar area extending beyond centre; terebra longer than abdomen | 7. COMMUNIS, <i>Först.</i> |

1. *collaris*, *Grav.*

Plectiscus collaris, Gr. I.E. ii. 987; Hal. Ann. Nat. Hist. 1839, p. 116; Först. Verh. pr. Rheinl. 1871, p. 89, ♀; Thoms. O.E. xii, 1300, ♂ ♀; Strobl, Mutt. Nat. Ver. Steierm. 1903, p. 127.

Head hardly constricted posteriorly, with vertex somewhat broad, cheeks short with no sulci. Antennae stout, filiform and piceous with their base flavidous; of ♀ with the penultimate joint transverse, of ♂ slender and elongate with elevated lines on the fifth to seventh joints of flagellum. Thoracic notauli short but deeply impressed; metathorax shining and obsoletely shagreened, with areola smoother and hardly

dilated; basal carina of petiolar area strong. Abdomen with third segment, apex of second and base of fourth bright testaceous; the compressed anus often concolorous; petiole of ♀ about twice longer than apically broad, subparallel-sided with postpetiole hardly broader than petiole and finely though distinctly aciculate-shagreened, with tubercles distinct and before its centre, with elongate lateral pilosity; second segment nearly glabrous, hardly longer than apically broad, with very distinct and subtriangular thyridii; remainder strongly compressed; terebra a little reflexed, rather longer than half abdomen with spicula pale and the basally incrassate valvulae piceous. Legs entirely pale flavous, usually with hind tarsi and their tibial apices, rarely also apices of their femora, infuscate. Stigma not narrow, piceous with both extremities pale, emitting radius from slightly beyond its centre; nervellus geniculate and subintercepted at its lower third. Length, 4-6 mm.



Four of Dr. Förster's forms are here synonymised:—Var. *connexus* (Vehr. pr. Rheinl. 1871, p. 89=*procerus*, *lib. cit.* p. 90) has the antennae twenty-two to twenty-four jointed, with propleurae testaceous or ferrugineous. Var. *spilotus* (*lib. cit.* p. 90=*collaris*, Först. l.c. p. 89) has similarly jointed antennae, but the propleurae are mainly black. Var. *praepositus* (*lib. cit.* p. 89) has the antennae only twenty-one jointed. The second form was found by Bridgman during May and June at Eaton, near Norwich.

This is said to be one of the commonest species in north and central Europe, though nothing is yet known of its economy; it had not been recorded from France in 1908, though van Burgst finds it about Breda in

1912. One of our commonest British species of this Tribe, though by no means ubiquitous, and I have not taken twenty specimens in as many years; Bridgman and Bignell did not meet with it. I have it from Braemar in July, 1907, and Banchory in September, 1910 (Elliott), a full series from Shere (Capron), Nunton in Wilts (Marshall), Felden (Piffard) and Finborough Park, Suffolk, in August (Tuck). In the same county I once met with the male in the middle of May, but it is distinctly an autumn species, occurring from Lackford Bridge on 22nd August, through September at Tuddenham Fen and Walberswick wood to October, on the 9th of which month I have taken the female sitting quietly beneath the gills of a fungus on elder in my Monks' Soham garden. Its connection with fungi is proved by the fact that on 3rd November, 1897, I took one actually in a ground fungus at Foxhall, near Ipswich. It also has been found at Denny Wood and Matley Bog in the New Forest.

2. *eurystigma*, Thoms.

Plectiscus eurystigma, Thoms. O.E. xii, 1301, ♀.

A black species with the legs and centre of abdomen testaceous, the mesothorax piceous, and the alar stigma broad, emitting the radial nervure from its centre. Length, 5 mm.

Similar to *P. collaris* in conformation, short cheeks and the first flagellar joint being evidently longer than the second; but with the former longer, the stigma broader, the apex of radial nervure shorter, the terebra shorter than half abdomen, the anus less compressed and the basal petiolar scrobes smaller.

This female was only known from Esperod in Sweden till Bridgman recorded it (Trans. Norf. Soc. 1894, p. 623) from Earlham, near Norwich, in September.

3. *tener*, Först.

Plectiscus tener, Först. Verh. pr. Rheinl. 1871, p. 86, ♀; Bridg. Trans. Ent. Soc. 1889, p. 432, ♂ ♀.

Body not entirely rufescent flavous. Antennae with only nineteen joints. Thorax with propleurae not entirely testaceous. Abdomen with spiracles of basal segment strongly and distinctly prominent; second segment entirely smooth; terebra not longer than abdomen.

We only know this name from its inclusion in Förster's meagre table of species; Bridgman merely enumerates the above points of distinction from our other species, adding that the male is in every way conformable to the female; Schmiedeknecht adds nothing. Probably the number of flagellar joints and conspicuous petiolar spiracles, should these characters prove constant, are sufficient to distinguish it. I simply follow Förster in placing it next to *P. canaliculatus* in the table of species.

The original female was from Germany; the only other known capture is that of a male and a female by Dr. Capron, presumably about Shere in Surrey, which are not named in his collection, though doubtless represented by a male and two females agreeing with the above description. Similar females have occurred to me on bracken at Wilverley in the New Forest and Grovely Wood near Salisbury (*cf.* Ichn. Brit. iii, 137) during the latter half of June.

4. *canaliculatus*, Först.

Plectiscus zonatus, Gr. I.E. ii. 982; Holmgr. Sv. Ak. Handl. 1854, p. 60, ♂ ♀ (?).
P. canaliculatus, Först. Verh. pr. Rheinl. 1871, p. 86, ♀; Thoms. O.E. xii. 1303,
 ♂ ♀; (?) Brisch. Schr. Nat. Ges. Danz. 1880, p. 201, ♀.

An elongate, black species with the pronotum piceous, the antennae basally below and the mouth including clypeus and legs whitish flavous; petiole linear and elongate. The hind coxae are piceous, the second segment not entirely smooth and the antennae are only 18-jointed. Length, $3\frac{1}{2}$ mm.

This is said by Thomson to differ from the last species in the extension of the petiolar area to a little beyond the metathoracic centre, the terebra only a third the length of the abdomen, the basal segment narrow and elongate, the second longer than broad, and the radial nervure emitted immediately beyond centre of stigma.

We must await the time when Dr. Pfankuch revises the Gravenhorstian types to know what *P. zonatus* really is: Förster (1871, p. 80) considers it a compound species; Thomson (1888, p. 1307) thought it perhaps synonymous with *Proclitus grandis*; and in the same year referred specimens to the present Försterian species, which Bridgman considered (Trans. Ent. Soc. 1889, p. 432) to represent *P. zonatus*. Though introduced as British in 1870, there are no specific records of the latter with us, and Haliday does not say that he knew it in 1839.

The larva of what he considered to be *Cryptus* (*Plectiscus*) *zonatus*, Grav., is described by Bouché in 1834 as cylindrical, curved, soft, fleshy, glabrous, shining, naked, white with translucent red; the small round head has pale brown mouth parts; the penultimate abdominal segment is elevated, and the anal extremity acuminate; length, $3\frac{1}{2}$ mm. It is said to live solitarily in larvae of *Hyponomeuta padella*; leaves its host to pupate and makes for itself by the side of its host an elliptic, brown-grey, papyraceous case (Naturg. p. 144). For my own part I do not believe this to be the larva of a Plectiscid at all; it is more probably Cryptid.

Bridgman does not record *P. canaliculatus* from Norfolk, so the examples cited from England by Thomson were probably those referred to by Bignell (Ichn. S. Devon, 1898, p. 38) as "captured at Bickleigh, 4 September."

5. *terebrator*, Först.

Plectiscus Terebrator, Först. Verh. pr. Rheinl. 1871, p. 87; Thoms. O.E. xii. 1302, ♀.

A black species with the abdomen not double length of terebra, the basal scrobes of its petiole distinct and its centre, with legs and antennal base, flavous. Head with vertex somewhat narrow and clypeus only apically flavous. Antennae slender with eighteen ♂ and twenty ♀ joints. Petiolar area not extending beyond centre of metathorax. Abdomen with basal segment somewhat broad, the second partly rugose, and terebra but slightly longer than half abdomen. Legs slender, with hind tibiae distinctly constricted at their basal third and basally infusate. Length, 5 mm. ♂ ♀.

This and the two following species are known from *P. collaris* and *P. euristigma* by their usually smaller size, slender legs and antennae, the

more obviously constricted basal third of the hind tibiae and the usually basally scrobiculate petiole. This species is distinguished from *P. collaris*, to which it is similar though smaller, in the more slender antennae and legs, basally infusate-ferrugineous hind coxae, narrower vertex and distinct petiolar scrobes. The male differs only sexually.

It has hitherto been recognised only from Aix and northern Germany; but I possess a specimen, certainly correctly named by Dr. Sigismund Brauns, which Alfred Beaumont captured on 27th July, 1898, at Chobham in Surrey. I took a female on the window of Monk's Soham House, Suffolk, on 30th August, 1907, and both sexes are well represented from Shere in Capron's collection.

6. *melanocerus*, Först.

Plectiscus melanocerus, Först. Verh. pr. Rheinl. 1871, p. 87, ♀. Var. *P. sodalis*, Först. lib. cit. p. 88, ♀; Thoms. O.E. xii. 1303, ♂ ♀.

A black species with the antennae slightly beneath and the legs pale, the hind coxae towards their base black, with the petiole apically deplanate and substrate on either side. Stigma somewhat narrow, emitting radial nervure from its centre; petiolar spiracles not prominent; antennae 16-jointed; terebra not longer than the two basal segments. Length, 3-4 mm.

The var. *sodalis*, hitherto regarded as the typical form, though antepaginated, has 21-jointed antennae, with the clypeus and antennal base distinctly pale; other forms differ in having 20- to 23-jointed antennae.

The typical form was captured in Prussia, and does not seem to have been taken elsewhere. Indeed, our own claim to it rests solely upon its record from Buckenham in the Norfolk Broads by Bridgman, and even this is queried, doubtless on account of Förster's inadequate description.

7. *communis*, Först.

Plectiscus communis, Först. Verh. pr. Rheinl. 1871, pp. 86 et 91; Thoms. O.E. xii. 1299, ♂ ♀.

A slender, black, piceous or testaceous species of variable colour. Head with the vertex broad and posteriorly roundly constricted; cheeks elongate and clypeus superficially discreted. Antennae somewhat stout and basally flavidous, with the flagellar joints distinct and in ♂ the sixth and seventh submarginate. Thoracic notauli almost wanting. Abdomen centrally flavidous; first segment basally bicarinate; terebra almost as long as whole body. Legs distinctly stout and flavidous. Wings with nervellus vertical and not geniculate. Length, 3-4 mm.

Thomson says it is distinct in its obsolete notauli, not very slender antennae and legs, entire and vertical nervellus, somewhat broad and posteriorly roundly narrowed vertex, strongly elongate terebra and basally bicarinate petiole.

It has been found at Aix-la-Chapelle (Förster), Ringsjön in Sweden (Thomson), northern France (Lethierry) and is not rare in Thuringia (Schm.). It has not hitherto been noticed in Britain, whence is an example in the Edinburgh Museum, which I have no hesitation in assigning to the present species. I also possess three females from Surrey and Hertfordshire in Capron's and Piffard's collections.

APERILEPTUS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 170 (?) ; Först. l.c. 1871, p. 75 ; Thoms. O.E. xii. 1297.

Head small and shortly triangular with the vertex posteriorly deeply emarginate, impressed behind ocelli and transcostate before occiput; eyes not pilose; face parallel-sided and slightly convex; clypeus broad, discreted and subconvex, cheeks subelongate; mandibles with the acuminate upper tooth the longer. Antennae slender, filiform and elongate with 18 to 23 joints, and erect but not verticillate pilosity; flagellar joints elongate and cylindrical with first longer than second. Mesonotum glabrous and nitidulous, with no notauli, and scutellar fovea broad and deep; metathorax convex, smooth and shining with no areae, though with the petiolar sometimes apically indicated. Scutellum convex and margined to its centre. Abdomen subsessile; basal segment gradually explanate, as long as apically broad and laterally substriate; the following segments smooth and shining, with second of ♀ much broader than long; terebra long, with its sheaths elongately pilose. Legs somewhat stout, with calcaria not short, and claws subelongate. Stigma not narrow; areolet entire and obliquely quadrate; parallel nervure emitted from centre of brachial cell; basal nervure continuous, and nervellus not geniculate.

This genus is at once known by the smooth and nitidulous metathorax with no areae, and by the subsessile abdomen.

1. albipalpus, Grav.

Plectiscus albipalpus, Gr. I.E. ii. 986, ♂ ♀ ; cf. Hal. Ann. Nat. Hist. 1839, p. 116 et Blanchard, Hist. Ins. iii. 316. *Aperileptus albipalpus*, Först. Verh. pr. Rheinl. 1871, pp. 77, 79 ; Thoms. O.E. xii, 1298, ♂ ♀ ; Brisch. Schr. Nat. Ges. Danz. 1880, p. 200, ♀ .

Head with the mouth stramineous, and ♀ face testaceous with an infusate mark or nigrescent with sometimes obsolete lateral marks below the scrobes dull stramineous. Antennae as long as body and in ♂ subdenticulate; three or four basal joints stramineous beneath. Thorax gibbous, of ♀ with the lateral sutures sometimes substramineous. Abdomen of ♂ with second and third segments discally testaceous; of ♀ as long and as broad as head and thorax, oblong or ovate, with basal segment sometimes apically stramineous; second segment black with its disc or apex testaceous, or testaceous with only its base black; third discally or basally testaceous; terebra as long as abdomen. Legs stramineous and normally stout; hind ones with tibial apices and the tarsi subinfusate. Wings ample and hyaline with the stigma and radius piceous, tegulae and radices whitish or stramineous, and the obliquely transverse areolet subpetiolate. Length, 4-5 mm.

I here give Gravenhorst's original description of this species, which Förster subsequently divided into over thirty, with additions from Thomson and Strobl. Some of the latter may be good, but only the typical one is recorded from Britain and that alone I recognise. In its most restricted sense *A. albipalpus* may be known by possessing 20-jointed antennae, vertical nervellus, prominent petiolar spiracles, terebra about length of abdomen, sternum black, face ferruginous with only clypeus, clypeal region and antennal base whitish flavous, and the legs immaculate testaceous.

This species is widely distributed on the Continent through France, Germany, Sweden, etc., but has hitherto been nowhere bred. With us, however, it appears to be of rare occurrence; at all events I have never met with it in Suffolk. Mr. Philip de la Garde has been so good as to send me three females and a male, bred in company, together with and undoubtedly from the fungus-gnat, *Mycetophila bimaculata*, Fab., in fungi at South Brent in southern Devonshire on 8th October, 1908. Earham near Norwich in July (Bridgman), a full series of both sexes at Shere (Capron), Felden in Herts (Piffard); a couple of females occurred to me on 15th June, 1907, in Matley Bog and on 12th July, 1909, on bracken at Setley marsh, in the New Forest. Most, if not all, of these have pale sternum.

PROCLITUS, Förster.

Clepticus, Hal. Ann. Nat. Hist. 1839, p. 116 (*nec* Cuv. Pices, 1829); *Proclitus*, Först. Verh. pr. Rheinl. 1871, p. 113.

Head about as broad as thorax, with vertex discreted from occiput by transverse costa; clypeus distinctly discreted, with deeply impressed lateral foveae; cheeks usually elongate with distinct sulci. Antennae 17-26-jointed, with short and erect pubescence; scape short and cylindrical, flagellar joints elongate and cylindrical with the first longer than the second. Thoracic notauli short; metathorax with areae distinct, but costulae wanting; petiolar area with no central carina. Abdomen with basal segment not roughly sculptured, always more or less nitidulous; its spiracles at or immediately beyond its centre, rarely before it; terebra distinctly exerted and always longer than basal segment. Legs slender with the onychii and pulvilli small. Areolet wanting, with its inner nervure short and usually punctiform; basal radial abscissa strongly curved and forming no acute angle with the apical; second recurrent nervure remote from inner of areolet; nervellus usually geniculate, for the most part far below centre, but emitting no distinct nervure.

The conformation of this genus resembles that of *Plectiscus*, but the areolet is externally wanting and internally so short as to usually be punctiform or wanting. All doubt respecting the synonymy of *Clepticus*, Hal. and *Proclitus*, Först. is removed by the fact that I have been enabled to synonymise the whole of the former's species with those described by the latter and Thomson under the later name; *Clepticus*, however, cannot be here adopted, since it was preoccupied by Cuvier for fishes; the above somewhat obvious synonymy renders Ashmead's new name *Mischoxorides* (Canad. Entom. 1900, p. 368) useless.

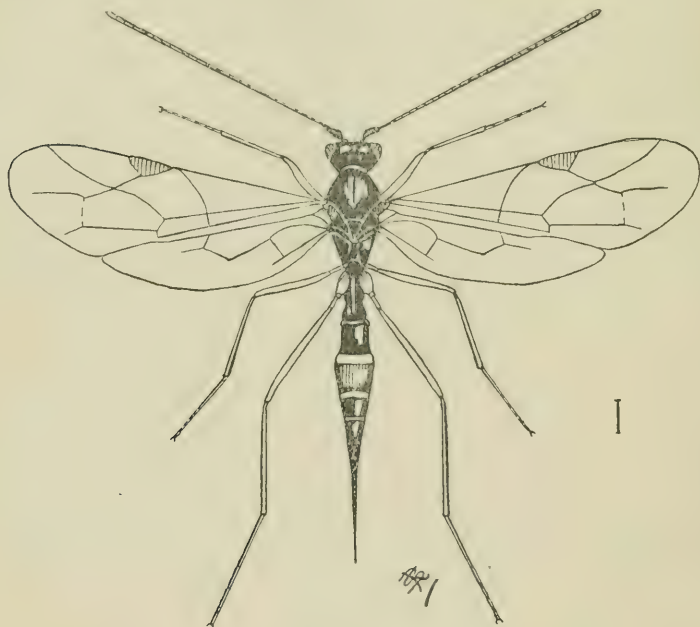
Table of Species.

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|---|------------------|
| (6). 1. Mesonotum centrally sulcate; terebra distinctly longer than half abdomen. | |
| (5). 2. Basal segment not short; terebra shorter than abdomen. | |
| (4). 3. Antennae stout, 23-jointed; legs stout; length, 5 mm. | 1. PRAETOR, Hal. |
| (3). 4. Antennae slender, 17-jointed; legs normal; length, 3 mm. | 2. SOCIUS, Hal. |
| (2). 5. Basal segment short; terebra as long as whole body | 3. COMES, Hal. |
| (1). 6. Mesonotum not centrally sulcate; terebra hardly half abdomen | 4. PAGANUS, Hal. |

1. *praetor*, Hal.

Clepticus praetor, Hal. Ann. Nat. Hist. 1839, p. 116, ♂ ♀. *Proclitus grandis*, Först. Verh. pr. Rheinl. 1871, pp. 116 et 119; Thoms. O.E. xii. 1306, ♂ ♀; (?) Brisch. Schr. Nat. Ges. Danz. 1880, p. 202, ♂. *Bassus remotus*, Marsh. Ent. Rec. viii, 1896, p. 296, ♀.

Head posteriorly distinctly constricted. Antennae elongate, apically attenuate and basally pale; of ♀ with 23–26 joints, of ♂ with 23 or 24 joints. Abdomen centrally testaceous and apically compressed; basal segment elongate, linear and somewhat smooth; second longer than broad, apically double its basal breadth, with thyridii oblique and remote from base; terebra but slightly shorter than abdomen. Legs pale testaceous, with hind tarsi and apices of both their tibiae and femora piceous; fourth hind tarsal joint longer than broad. Radial nervure emitted from beyond centre of stigma, nervellus distinctly geniculate below its centre. Length, 5–6½ mm.



The largest species of the genus, known by its somewhat elongate antennae which are apically subattenuate, the posteriorly obviously narrowed head, the apically explanate face with subindicated epistomal lines; the black stigma emitting radius from beyond its centre, the lower angle of brachial cell not rectangular; in the lower wings the basal abscissa of the cubital nervure only half length of the recurrent, and the nervellus evidently geniculate below its centre; the elongate-fusiform abdomen apically compressed, with its basal segment elongate, linear, and subglabrous, the second longer than broad with strong thyridii; and by the colour of the legs.

The synonymy here adopted, giving priority to Haliday's name, is so obvious from his lucid generic and specific descriptions that one can only suppose its previous neglect to be owing to the somewhat general nature of the Ann. Nat. Hist. As I have already noted, this synonymy was anticipated by Marshall in MS. (*cf.* Ichn. Brit. iii. 14, footnote). That he knew little of the genus, however, is evident from the fact that the typical and unique specimen of *Bassus remotus*, now in the British Museum, is no more than a stout and well-developed female of the present species, captured on 30th July at Vadsö, in Lapland.

Hitherto we have a very slender claim to Förster's species as British, resting entirely upon Bridgman's queried record (Trans. Ent. Soc. 1886, p. 355) of a single female, taken at the end of September at Earlham, near Norwich; Thomson considered it not rare throughout northern and central Europe; it is recorded from France, Sweden and Germany. Haliday found it in shady places in Ireland, and I have swept the female in a marshy spot at Claydon Bridge in Suffolk so late in the year as 7th October.

2. *socius*, Hal.

Clepticus socius, Hal. Ann. Nat. Hist. 1839, p. 116, ♀. *Proclitus iniquitus*, Först. Verh. pr. Rheinl. 1871, p. 114, ♀; Thoms. O.E. xii, 1308, ♂. *P. albidipes*, Först. *lib. cit.* p. 117; Brisch. Schr. Nat. Ges. Danz. 1880, p. 202, ♂.

Head somewhat constricted posteriorly; face with no impressed lines, centrally elevated; cheeks short and in ♂ obsolete; clypeus convex. Antennae stout, in ♀ with seventeen and in ♂ with eighteen joints; basal flagellar joint little longer than second. Abdomen ovate, with basal segment nitidulous and substriate; apex of second segment and whole of third, except infusate lateral marks, ochraceous; terebra fully two-thirds length of abdomen. Legs somewhat stout and stramineous with hind ones hardly dark-marked; base of front tibiae slightly curved; apical joint of hind tarsi almost longer than second. Wings with stigma piceous, and emitting radial nervure beyond its centre; nervellus oblique and hardly geniculate. Length, 3–3½ mm.

Only known from Prussia and southern Sweden. Haliday described it from Ireland and I have swept the female from nettles at Wherstead, near Ipswich, so late in the year as 29th October; Piffard took the same sex at Felden, and there is a long series comprising both in Capron's Surrey collection.

3. *comes*, Hal.

Clepticus comes, Hal. Ann. Nat. Hist. 1839, p. 116, ♀. *Proclitus macrurus*, Först. Verh. pr. Rheinl. 1871, p. 116; Thoms. O.E. xii. 1307, ♀.

Head not very strongly constricted posteriorly. Antennae 22-jointed and basally stramineous. Abdomen ovate with apex of second segment and whole of the third, except infusate lateral marks, ochraceous; basal segment nitidulous and substriate, broad, somewhat short and distinctly sulcate, with spiracles almost beyond its centre; thyridii of second segment oblique; terebra distinctly longer than whole abdomen. Legs stramineous. Length about 4 mm. ♂ unknown.

This female is the only one with the terebra distinctly longer than abdomen; Haliday terms it as long as the body.

Recorded on the Continent only from Helsingborg in southern Sweden and Aix in Prussia. Haliday described it from Ireland.

4. *paganus*, Hal.

Clepticus paganus, Hal. Ann. Nat. Hist. 1839, p. 116, ♀. *Proclitus longitarsis*, Thoms. O.E. xii. 1306.

A black species with the underside of the scape, the centre of the abdomen and the legs pale, and of ♀ anus compressed. Abdomen of ♀ ovate with apex of second segment alone ochraceous, of ♂ parallel-sided with centre pale; basal segment scabriculous and centrally sulcate; terebra half length of abdomen; legs stramineous. Length about 3 mm.

This species is recognised by having the head hardly constricted posteriorly, the genal sulcus somewhat long, the face deplanate and parallel-sided, the clypeus transverse and apically subtruncate; antennae not very long, filiform, with discreted joints; central mesonotal sulcus wanting; anus compressed, basal segment linear with its discal sulcus distinct, the second subquadrate with its thyridii not oblique, nor terebra elongate. I have synonymised *P. longitarsis*, rather than *P. clypearis*, with the present species, on account of its larger size and immaculate hind coxae.

Thomson describes his species, of uncertain sex, from northern Germany; Haliday captured his female at Eyrecourt, Co. Galway, in Ireland, during September. I have a Surrey male in Capron's collection.

EUSTERINX, Förster.

Först. Verh. pr. Rheinl. 1868, p. 172, (?); Först. l.c. 1871, p. 107; Thoms. O.E. xii. 1293.

Head small with vertex rather broad and discreted from occiput by an acute costa; eyes not pilose; face slightly convex, and parallel-sided; clypeus discreted and convex; cheeks somewhat short; both face and frons immaculate. Antennae stout and 17- to 22-jointed, with short and recumbent pubescence, of ♀ apically incrassate; basal flagellar joint longer than second, and the sixth of ♂ usually slightly emarginate externally. Thorax with deeply impressed notauli, sometimes extending to mesonotal disc and there subcoalescent; metathoracic areae distinct with costulae usually entire. Scutellum convex and only basally margined. Abdomen petiolate; basal segment sublinear and dull, with spiracles beyond its centre and postpetiole a little broader than petiole; thyridii of second segment distinct; terebra always exserted, but hardly longer than basal segment, with valvulae somewhat stout and distinctly pubescent. Legs with the calcaria short, the claws and pulvilli small, and femora usually incrassate. Stigma not very broad; areolet with outer nervure always wanting, the areolar nervure distinct, and parallel emitted from centre of brachial cell; nervellus not geniculate.

The areolet in this genus is externally obsolete, just as in the Cryptid genus *Hemiteles*; and all the known species are quite small.

1. *obscura*, Först.

Eusterinx obscura, Först. Verh. pr. Rheinl. 1871, p. 108; Schm. Opus. Ichn. 2186, ♀.

This species differs from the whole remainder of the present genus, of which sixteen or seventeen have been described, or more correctly indicated, on the Continent, by having all the coxae nigrescent.

It was originally indicated from Germany, probably about Aix, and no one seems to have since recognised it, though Gaulle in 1908 records it in his French Catalogue. Bridgman includes it (Trans. Norf. Soc. 1894, p. 623), with no hesitation and no remark upon its novelty as British, in his Ichneumons of Norfolk, where it occurred in May at Earlham, near Norwich.

MEGASTYLUS, *Schiödt*.

Schiöd. Guér. Mag. Zool. 1839, Ins. pl. vi, p. 7; Först. Verh. pr. Rheinl. 1871, p. 104.

Head small and posteriorly constricted, with the vertex not posteriorly emarginate; frontal orbits of ♀ always immaculate; clypeus always strongly and distinctly discreted, convex and laterally somewhat compressed with strong lateral foveae; cheeks elongate and mandibles strongly acuminate, with the teeth of unequal length. Antennae elongate with the scape short, subcircular and apically obliquely truncate; pedicellus large; flagellum of ♀ with verticillate pilosity and at least forty joints, of ♂ short with straight pilosity and the central joints not emarginate; basal flagellar joint longer than second. Thorax elongate with no notauli; metathorax with a basal trans-sulcus, no discal areae and at most the petiolar area short. Scutellum convex and laterally strongly compressed. Abdomen petiolate, deplanate and subspatuliform; basal segment apically but little explanate, with spiracles shortly before its centre, thyridii of the second distinct, and terebra concealed. Legs slender and elongate, with calcaria not very short. Areolet wanting, with areolar nervure somewhat long and hardly shorter than it is distant from second recurrent nervure; lower external angle of discoidal cell subacute; nervellus slightly geniculate.

1. *cruentator*, *Schiöd*.

Megastylus cruentator, Schiöd. Guér. Mag. Zool. 1839, Ins. p. 4, pl. iv, fig. 1, ♂; Nat. Tids. 1847, p. 97; Holmgr. Sv. Ak. Handl. 1855, p. 128; Först. Verh. pr. Rheinl. 1871, p. 104; Brisch. Schr. Nat. Ges. Danz. 1878, p. 76; *lib. cit.* 1892, p. 38, ♂ ♀; Thoms. O.E. xii. 1313, ♂. *Helictes cruentatus*, Hal. Ann. Nat. Hist. 1839, p. 115, ♀.

Head posteriorly constricted with the mouth and clypeus rufescent, and palpi whitish. Antennae basally rufescent beneath. Thorax with the pleurae and sternum rufescent, and the notauli strong, extending distinctly beyond mesonotal centre; metathorax elongate, with areae indistinct. Scutellum rufescent. Abdomen black, rarely with second and third segments in both sexes more or less testaceous or badious; basal segment linear and slightly curved, with the second longer than

broad; anus explanate, with dense and subelongate pubescence. Legs slender and rufescent with the hind ones elongate, and their tarsi and apices of tibiae nigrescent; calcaria almost longer than onychii. Wings narrow, with tegulae whitish; parallel nervure emitted below centre of brachial cell; nervellus somewhat distinctly geniculate. Length, $6\frac{1}{2}$ –8 mm.

Known by the short cheeks with no sulci, alutaceous mesopleurae, strong notauli, geniculate nervellus and the constriction of the radial cell before its apex.

Schjödte frequently found it in Danish woods during autumn, sometimes copiously among alders; Holmgren records it from woods in Sweden and Lapland; Förster took it about Aix; Brischke also found it in Prussia; Gaulle knows it in France, and Schm. tells us it is not uncommon in shady and grassy places in Thuringia. In Britain, Haliday mentions it from England and shady places in Ireland; I do not understand why he and Schjödte applied the same specific name nor who ought to have priority, which I have simply followed custom in according to the latter. Haliday remarks that this species is "very active, and is continually rolling and unrolling the spiral of its antennae" (referred to by Marshall, *Braconides d'Europe*, iii. 91). It is by no means common with us, occurring rather in marshes than woods and probably passing the winter in the perfect state, for, besides those recorded from Shere by Capron (*Entom.* 1880, p. 89), I have only seen it between the 8th and 26th September and between the 17th and 21st May, in the New Forest, Tuddenham Fen, Covehithe Broad and Tostock in Suffolk, where the female was taken in 1898 and 1900 by Tuck.

2. *conformis*, Först.

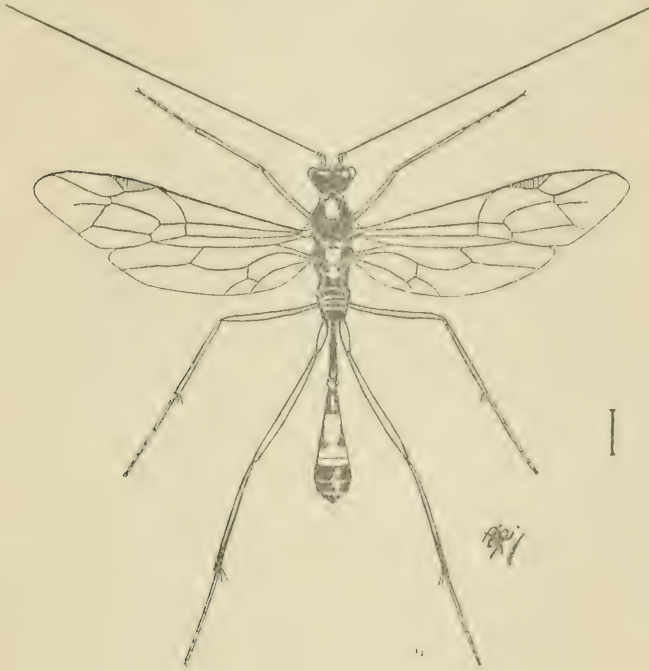
Megastylus conformis. Först. Verh. pr. Rheinl. 1871, p. 105, ♂ ♀.

Head posteriorly constricted and small, with mouth pale. Antennae of ♀ 45-jointed; of ♂ very slender, filiform and nearly as long as body, with scape entirely testaceous. Thorax black with the pro- and mesosternum and mesopleurae testaceous; mesonotum strongly nitidulous, with only obsolete apical notauli; propleurae and whole metathorax black, the latter not very dull with obsolete areae and only the petiolar basally strong. Scutellum testaceous, with its basal sulcus red. Abdomen black and somewhat shining with third segment nearly entirely, and in ♂ the fourth segment mainly, pale testaceous; basal segment straight, subparallel-sided, with central spiracles and no discal sulcus; terebra hardly visible beyond anus. Legs entirely pale testaceous with all the onychii, apices of hind tibiae broadly and of their femora narrowly nigrescent. Wings narrow with stigma luteous, tegulae dull pure white; basal nervure not continuous and nervellus strongly geniculate. Length, 6 mm.

This species differs from all others known to Förster in having the mesopleurae pale, propleurae black whereas in *M. cruentator* they are testaceous, and the abdomen centrally pale with immaculate metapleurae. It is much smaller, paler and more fragile than the last species with notauli obsolete and basal nervure not continuous. I am not sure that it were not more correctly placed in *Dicolus*, on account of its subbasally impressed metathorax, where it is certainly closely allied to *D. excubitor*,

Först., but it is larger, with basally strong petiolar area, somewhat nitidulous metanotum and basally black metathorax.

The above description is drawn from a male, beaten from an oak-tree at Palmer's Heath, near Brandon in Suffolk, on 20th May, 1911, and an



apparently co-specific female from Surrey in Capron's collection. Elsewhere it has only been recorded from Aix in Prussia and Plym Bridge in Devon, where it was taken on 27th May by Bignell.

DICOLUS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 171 (?); Först. *lib. cit.* 1871, p. 96.

Head small and posteriorly constricted with vertex separated from occiput by an acute costa, and not impressed; eyes large, cheeks short, with no sulci; face deplanate and slightly constricted apically with two deeply impressed central longitudinal sulci; clypeus distinctly discreted, strongly convex, laterally compressed with lateral foveae deep; mandibles not apically bidentate. Antennae as in the last genus, of ♀ 31 to 34-jointed; scape incrassate and apically oblique; flagellar joints cylindrical and elongate with the first much longer than second, in ♀ with long verticillate pilosity, in ♂ with shortly erect hairs and the central joints not emarginate. Thorax elongate, with wanting or subindicated notauli; metathorax deeply constricted a little before its centre and thus bisected;

basal area obsolete or wanting, petiolar short and distinct; sternum always pale. Scutellum apically strongly compressed on either side. Abdomen elongate, of ♂ narrow and of ♀ explanate towards the anus; basal segment sublinear and hardly broader apically, with subcentral spiracles; terebra not exerted. Legs long and slender, with apical third of hind tibiae often constricted. Areolet always wanting, with distinct areolar nervure; nervellus geniculate.

The constriction of the metathorax is characteristic of this genus and unique among Ichneumonidae.

Table of Species.

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| (4). | 1. Apical third of hind tibiae broadly emarginate; calcaria somewhat long. | |
| (3). | 2. Frontal orbits apically white; face flavidous; antennae 34-jointed .. | 1. PECTORALIS, Först. |
| (2). | 3. Frontal orbits not white; face piceous; antennae 31-jointed .. | 2. SUBTILIVENTRIS, Först. |
| (1). | 4. Apical third of hind tibiae not emarginate; calcaria somewhat short | 3. INSECTATOR, Först. |

1. *pectoralis*, Först.

Dicolus pectoralis, Först. Verh. pr. Rheinl. 1871, p. 97; Thoms. O.E. xii, 1315, ♂ ♀.

A black, piceous, flavous and white-marked species. Frontal orbits in both sexes shortly pale; face testaceous. Antennae 33 or 34-jointed in both sexes. Metathorax finely alutaceous and not scabriculous, with the central frenal area wanting, the costulae wanting, but the transverse carina entire and rendering the petiolar area determinate; sternum pale. Hind tibiae strongly constricted at their apical third, with somewhat elongate calcaria. Head with vertex narrow. Length, 3-4 mm.

Bridgman considered this species "very distinct and easily recognised," though the above is the total description at present available.

He says (Trans. Ent. Soc. 1883, p. 169) that it "is added to our list on the strength of a female which was sent to me by the Rev. T. A. Marshall," without locality. Bignell, however, confirms it as British by recording it from Horrabridge in Devon on 4th July; and I also possess a female labelled Teddington, October, 1891, from de la Garde.

2. *subtiliventris*, Först.

Dicolus subtiliventris, Först. Verh. pr. Rheinl. 1871, p. 97; Bridg. Trans. Ent. Soc. 1887, p. 368; Thoms. O.E. xii, 1315, ♀.

A black species, with pale markings and the frontal orbits immaculate. Head shining and very finely punctate, posteriorly constricted; clypeus small, semicircular and distinctly discreted from the partly piceous face, which is centrally prominent; mouth and clypeus fulvous, palpi whitish. Antennae rufescent and paler beneath, a little longer than body, with thirty-one densely and elongately pubescent joints. Thorax discally

partly piceous, narrower than and similarly punctate to the head, nearly thrice longer than broad, with the pro-pleurae and -sternum, meso-pleurae and -sternum fulvous; notauli wanting; metathorax generically constricted, with no areae but the petiolar basal costa strong. Abdomen nigrescent-piceous with whole of third segment except lateral marks, apical margin of second and base of the fourth centrally, stramineous; longer than head and thorax and apically explanate; basal segment slender and elongate, about four times longer than broad, with antecentral spiracles; post-petiole hardly broader; second and third segments longer than broad and of equal length; fourth cylindrical and a quarter longer than broad, following transverse; terebra slender, straight and hardly exerted. Legs slender and pale fulvous, with anterior coxae and trochanters pale stramineous; hind coxae elongate and externally infusate towards apices; hind femora and tibiae subinfusate apically, and the latter with a wide notch before the apex. Wings with radix and tegulae stramineous; stigma subinfusate; areolet wanting and stigma of normal size; apical radial abscissa distinctly sinuate and nervellus obsoletely geniculate immediately below its centre. Length, about 5 mm. (Bridg.) or only about 3 mm. (Thoms.).

"It is impossible to be sure that this is really Förster's species, because his description is so short," says Bridgman in publishing the above account of *D. subtiliventris*; and Schmiedeknecht is inclined to think Bridgman had *D. hirticornis*, Strobl, before him at the time, mainly on account of its large size.

This female was captured at Bickleigh, near Plymouth, in Devon, as late as 21st October, by Bignell. I know the species as indigenous only from a couple of specimens sent me by Atmore, who took them about Kings Lynn in Norfolk during August, 1911.

3. insectator, Först.

Dicolus insectator, Först. Verh. pr. Rheinl. 1871, p. 97, ♀; Thoms. O.E. xii, 1316, ♂ ♀.

A black species with pale markings, and both costulae and frenal area very distinct; metathorax entirely testaceous or piceous, and the ♀ antennae 33-jointed. Length, 3-4.5 mm.

This species is known at once from all others by its very strong metanotal costulae, as well as by the somewhat strongly convergent inner orbits, by the slender ♀ flagellum with the joints elongate and not elongately pilose, and by the discally whitish anus.

Found about Aix by Förster, near Lund by Thomson and in France by Lethierry. It was introduced as British with some hesitancy by Bridgman (Trans. Ent. Soc. 1886, p. 355), who examined a specimen taken at Penzance by E. D. Marquand in 1883 and recorded by the latter in his "Ichneumonidae of the Land's End District" (Trans. Penz. Nat. Hist. Soc. 1884, p. 346); Marquand's collection was in the possession of the late W. A. Luff up to the time of his death. I anticipate that this species has hitherto been overlooked on account of its small size; its distribution must be very wide with us—if Bridgman's name be correct—for I possess a couple of males, taken on 1st September, 1892, by the late Alfred Beaumont at Pitlochry in Perthshire.

HELICTES, *Haliday*.

Hal. Ann. Nat. Hist. 1839, p. 115; *Idioxenus*, Först. Verh. pr. Rheinl. 1871, p. 94.

Head small with the vertex broad, roundly constricted posteriorly and acutely discreted from occiput, but not posteriorly emarginate; clypeus convex, strongly discreted, apically truncate and laterally somewhat compressed, with large lateral foveae; cheeks large and not sulcate; mandibles small and apically subentire. Antennae slender and 25 to 33-jointed, with the scape short, bulbiform and obliquely excised; pedicellus large and the ♀ flagellar joints not verticillate-pilose; basal flagellar joint fully twice longer than second or in ♂, which has some of joints five to eight emarginate, slightly shorter than second. Thorax subcylindrical, with short notauli; metathoracic areae weak and the discal often indistinct; petiolar area short. Scutellum convex and basally declived. Abdomen petiolate and usually broader beyond centre; basal segment linear, laterally sinuate and not margined, apically hardly broader, with spiracles at or very shortly before its centre; terebra not exerted. Legs slender and, especially the hind ones, elongate; front coxae small, the hind ones granulate and widely separated; hind tibiae not incrassate nor basally constricted; calcaria short, onychii and onyches small. Areolet wanting, with the areolar nervure very short and remote from second recurrent; parallel nervure emitted from centre of brachial cell; nervellus not or hardly geniculate.

Table of Species.

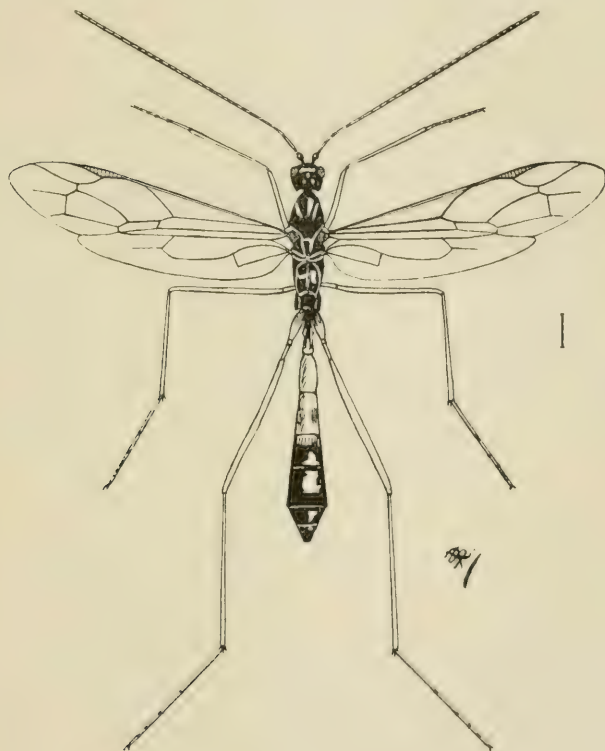
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| (6). | 1. Hind coxae nigrescent; face and thorax immaculate. | |
| (5). | 2. Abdomen centrally, and hind femora, distinctly pale. | |
| (4). | 3. Second ♀ flagellar joint short, eighth of ♂ strongly excised | 1. ERYTHROSTOMUS, <i>Gmel.</i> |
| (3). | 4. Second ♀ flagellar joint elongate, eighth of ♂ simple | 2. MEDIATOR, <i>Schöd.</i> |
| (2). | 5. Abdomen with only incisures pale; hind femora dark | 3. BOREALIS, <i>Holmgr.</i> |
| (1). | 6. Hind coxae entirely pale; face and thorax white-marked | 4. VARIUS, <i>Hal.</i> |

1. *erythrostomus*, *Gmel.*

Ichneumon erythrostoma, Gmel. S.N. 1790, 2721. *Plectiscus erythrostoma*, Gr. I.E. ii. 988; Holmgr. Sv. Ak. Handl. 1854, p. 60; Brisch. Schr. Nat. Ges. Danz. 1877, p. 7, ♂. *Helictes fulvicornis*, Hal. Ann. Nat. Hist. 1839, p. 115, ♀. *Myiarthrus erythrostoma*, Först. Verh. pr. Rheinl. 1871, p. 103, ♀. *Helictes erythrostoma*, Thoms. O.E. xii. 1311, ♂ ♀.

Head a little constricted posteriorly, with the vertex broad; eyes small and cheeks elongate. Antennae almost shorter than thorax, with second flagellar joint not twice longer than broad; ♂ with the sixth to eighth flagellar joints externally deeply emarginate, with the excision subdentate at both extremities. Thorax with mesonotum very finely rugose and notauli elongate, but not deeply impressed; metathorax transverse with

the areae somewhat distinct in ♀, obsolete with only the small petiolar area distinct in ♂. Abdomen centrally rufescent and not compressed; two basal segments finely scabriculous with the latter not transverse, its thyridii small and circular. Legs dull rufescent with the hind coxae, and rarely also the intermediate ones, basally nigrescent; fourth joint of hind tarsi not twice longer than broad. Stigma narrow and flavescent; basal abscissa of radius curved, the apical straight and elongate; nervellus subgeniculate below its centre. Length, 4-5 mm.



Known by the dark hind coxae, centrally broadly rufescent abdomen, deeply emarginate eighth ♂ flagellar joint and by the second of ♀ not being twice longer than broad.

Apparently common on the Continent, and recorded from Holland, Sweden, Prussia and France. With us it was first noticed in 1829 (Gr. I.E. i. 718) from Netley in Shropshire, and subsequently by Bridgman from Aylesham in Norfolk during May; it must be very rare, however, for I possess but a single male, captured some years ago by Mr. Albert Piffard at Felden in Herts.

2. *mediator*, *Schiöd.*

Megastylus mediator, Schiöd. Guér. Mag. Zool. 1839, Ins. p. 5 et Nat. Tids. 847, p. 97, ♀; Holmgr. Sv. Ak. Handl. 1855, p. 129, ♂. *Idioxenus mediator*, Först. Verh. pr. Rheinh. 1871, p. 95, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1878, p. 77, ♂. *Helictes mediator*, Thoms. O.E. xii. 1312, ♂ ♀.

Black with the abdomen centrally entirely and the legs rufescent, hind coxae nigrescent towards their base and antennae longer than thorax; eighth flagellar joint of ♂ hardly emarginate. Length, 5–6 mm.

Very like the preceding species but the ♀ antennae are longer with the second flagellar joint at least twice longer than broad, the hind tarsi more slender with the fourth joint very nearly twice longer than broad, and the metanotal areola hardly indicated; the ♂ has the eighth flagellar hardly at all emarginate and the head more strongly constricted posteriorly.

Schiödte first took the female in Danish woods during October; and it is said to be not uncommon throughout northern and central Europe. It is extremely like the next species and I am not satisfied respecting their distinction, since Thomson does not refer to the latter. The present insect is recorded from Exeter early in September by Bignell, and from Brundall near Norwich in July by Bridgman; Capron records it from Shere in Surrey (Entom. 1880, p. 89) and there are half a dozen in his collection. To me it has occurred only twice, at Matley Bog in the New Forest early in August, 1901, and by sweeping nettles by a wood at Wherstead, near Ipswich, on 27th October, 1903.

3. *borealis*, *Holmgr.*

Megastylus borealis, Holmgr. Sv. Ak. Handl. 1855, p. 129, ♂ ♀. *Idioxenus borealis*, Brisch. Schr. Nat. Ges. Danz. 1878, p. 77, ♀. *Helictes borealis*, Schm. Opus. Ichn. 2249, ♂ ♀.

Schmiedeknecht tells us that this species is similar to *H. mediator*, but with the head scarcely constricted posteriorly and the hind legs much darker; and differing from both the last species in having the abdomen not centrally red but with only the incisures of the three basal segments dull testaceous; the metathorax of the female is distinctly a little dull with its areae more distinct and that of the male shining, with no areae. Length, 5 mm.

He also only records it from Lapland and northern Sweden—where Holmgren tells us it occurs in shady woods from August 4th to September 1st—though allowing Brischke's Prussian reference to be correct. Possibly our species is not the true *M. borealis*; it certainly has all the features ascribed to it,

"In the genus *Megastylus* I have to add *M. borealis*, Holmg." to the British fauna, says Capron in his Notes on Hymenoptera about Shere (Entom. 1880, p. 89); and Bignell subsequently took it at Bickleigh, Plym Bridge and Oreston in Devon during June, July, August and September. I have found it equally common from May 3rd to October 10th, though it appears to be a summer rather than an autumn species. Besides the six in Capron's collection referred to above, I have it from Banchory

in the Highlands during July, 1909 (misnamed *mediator* by me, E.M.M. 1910, p. 37), Felden in Herts (Piffard) and Tostock in Suffolk (Tuck). Unfortunately I can add nothing towards a knowledge of its economy, for, though the species is abundant throughout Suffolk, it is invariably met with by promiscuous sweeping of nettles and grass or beating of oak and whitethorn, sometimes flying in the air on still days of July. I have found it at Bentley, Bramford, Reydon, Southwold, Belstead, Tuddenham Fen, Staverton Thicks and Blakenham; elsewhere at Gosfield in Essex, Burwell Fen in Cambs, Felden in Herts, Ryde and Shalfleet in the Isle of Wight and on bracken at Wilverly, Burley and Matley Bog in the New Forest.

4. *varius*, Hal.

Helictes varius, Hal. Ann. Nat. Hist. 1839, p. 115, ♂.

Abdomen petiolate with the basal segment attenuate, laterally sinuate with central tubercles; terebra concealed or hardly exerted. Thorax coarctate-cylindrical. Antennae slender and curled with their basal joint prominent, the scape bulbiform and obliquely excised. Areolet wanting. Legs slender, with the hind ones subelongate. A central abdominal band and the legs fulvous with the trochanters, anterior coxae and face, with a hamate line before the wings, whitish. Length, 6 mm.

This unique male was captured at Portmarnock on the coast of Dublin during June. It is here included as a British insect, though no one has recognised it since its first description, and I was unable to discover the type among Haliday's collection in the Dublin Museum in 1910. It certainly does not belong to the present genus, but I know not where else to place it.

MIOMERIS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 171 (?); Först. *lib. cit.* 1871, p. 91.

Head subcubical with vertex discreted from occiput by an acute transcarina; face deplanate and not protuberant below scrobes; clypeus not discreted, but with large lateral foveae; cheeks elongate and subbucate; mandibles stout and little narrowed apically. Antennae of ♀ short and stout with short pilosity, of ♂ longer and more slender; both sexes with scape cylindrical and the first flagellar joint shorter than second, ♂ with the latter basally emarginate. Thorax stout, with short and deeply impressed notauli; mesonotum deplanate; metathorax with strongly costate areae, areola elongate and petiolar area short. Scutellum somewhat deplanate. Abdomen petiolate, nearly smooth and shining, strongly deplanate throughout, with spiracles of basal segment central and terebra not exerted. Tibiae subcompressed and first joint of front tarsi deeply excised basally. Areolet wanting, with areolar nervure not short; basal radial abscissa straight; parallel nervure emitted far below centre of brachial cell; nervellus oblique and geniculate below its centre.

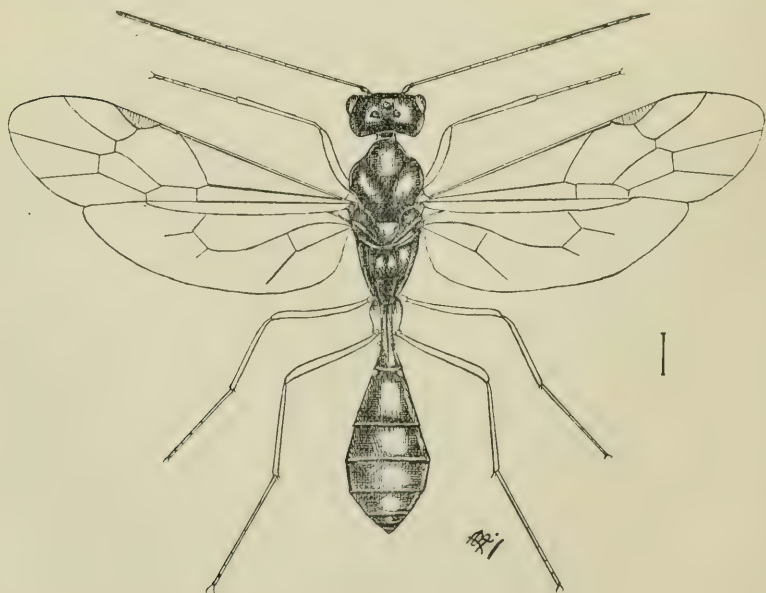
This genus is said by Thomson to form a connecting link with the *Exochides*; I consider it much closer to the *Stilpnides*. He described a Swedish and French species, which had not the first flagellar joint shorter than the second; but this seems to me a capital generic character.

1. *aquisgranensis*, Först.

Miomeris aquisgranensis, Först. Verh. pr. Rheinl. 1871, p. 92; Thoms. O.E. xii. 1317, ♂ ♀.

A black species with the head and thorax finely and diffusely pubescent. Palpi and mandibles testaceous. Antennae basally testaceous, of ♀ short and 16-jointed, with the seven apical joints large and well discreted, of ♂ extending beyond thoracic apex with nineteen cylindrical joints; scape short and cylindrical; basal flagellar joint in both sexes shorter than second, and the latter in ♂ externally emarginate at its base. Metathorax finely scabriculous. Abdomen immaculate, with first segment and part of the second finely scabriculous, remainder smooth and very strongly nitidulous; terebra flavous, not extending beyond anus. Legs testaceous with the hind coxae mainly or entirely black. Wings of ♀ very narrow and of ♂ much broader. Length, 4-4.5 mm.

It was discovered in both sexes at Aix-la-Chapelle by Arnold Förster; and Thomson, who did not find it in Sweden as given by Dalla Torre, records it also from England, whence it had been sent him by Bridgman, who had already correctly named (Trans. Ent. Soc. 1883, p. 169) a male of this species, taken by Mr. E. Parfitt in the neighbourhood of Exeter, where Bignell tells me Parfitt's collection is still to be found. It is certainly rare with us and I have not met with it myself, though my collection contains three females taken by Capron about Shere and one male, kindly given me by Mr. Frank Morey, who captured it in Parkhurst Forest, Isle of Wight, early in August, 1907.



TRIBE

PORIZONIDES.

This Tribe is one of the most natural and easily recognised groups among the whole Ichneumonidae. It is primarily characterised by the short and extremely broad radial cell, formed by the subrectangular geniculation of the radial nervure at its junction with the inner nervure of the always externally incomplete areolet. In the present Tribe this inner nervure is termed the areolar and, unlike nearly all other Tribes, is continuous with or emitted by the cubital nervure but slightly before the second recurrent nervure. The lack of external nervure of the areolet resembles the same feature in the Cryptid genus *Hemiteles*; and we often find so great an analogy with that genus that it is only by the rectangular radius and the apically compressed abdomen that the present group is to be differentiated. One of the main difficulties of the Ichneumonidae is obvious relationship between groups, which are in other respects far removed. That the present is truly Ophionidous is, however, undoubted; the abdomen is invariably compressed, unlike *Hemiteles* much more strongly in the males than the females, the petiole is always distinct, usually extremely slender and often elongate, the metanotal areae are always incomplete with at least the costulae wanting, and what is referred to in descriptions as the basal area is, in reality, the areola, for the petiolar area here rises so far towards the metathoracic base as to occupy more than half that segment. Upon this point I should like to express my scepticism in the value of the unicarinate basal area, upon which species and even subgenera have been founded; in this group the presence or absence of this area is extremely variable—it may be entire, longitudinally multicarinate, longitudinally unicarinate or wanting in the same species, as I have shown in *Diaparsus geminus*.

Respecting the hosts of this group, they would appear from such scattered evidence as has hitherto been adduced to have to be sought among the Coleoptera, usually among those Coleoptera which subsist upon fungi; and the latter circumstance renders one suspicious. Besides beetles certain Tineae moths and a great many Mycetophilid diptera feed in fungi, and I am not aware that these parasites have been subjected to a more rigorous investigation than their emergence along with the beetles affords; they may even, like the Mesochorides, be hyperparasitic, though such does not seem probable. I think Dr. Giraud must have been mistaken in supposing he had bred a species from *Chrysopa perla*, one of the neuropterous Lace-wing Flies.

A great many more species is known in the neighbouring countries of Europe than has yet been recorded from Britain; but I have, among my three hundred specimens of this Tribe, found it necessary to add but one to those compiled by Desvignes, Marshall and Bridgman. Considerable care is necessary to the correct elucidation of these often very small insects, though no great difficulty will be found attached to the task, if long series be available, and only five of my specimens baffled me; but in the case of isolated individuals, and especially males, it is a very different matter.

Table of Genera.

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|------|----|---|-----------------------|
| (2). | 1. | Calcaria curved and of normal length;
hind tarsi elongate with joints
gradually diminishing in length;
thorax usually cylindrical .. | PORIZON, Grav. |
| (1). | 2. | Calcaria straight and short; hind
tarsi of normal length with second
to fourth joints gradually shorter,
but first and fifth abruptly elongate;
thorax short and coarctate. | |
| (4). | 3. | Flagellum multi-articulate; lower
angle of brachial cell entire;
notauli short but distinct; thyridii
large and elongate-triangular .. | DIAPARSUS, Thoms. |
| (3). | 4. | Flagellum often pauci-articulate;
lower angle of brachial cell
sometimes incomplete; notauli
wanting or obsolete; thyridii
small | THERSILOCHUS, Holmgr. |

PORIZON, Fallén.

Fall. Specimen. Hym. (1813), 17; Holmgr. Sv. Ak. Handl. 1858, p. 132.

Body large or of normal size, rarely small; abdomen never entirely black. Head rarely subcubical, with frons often smooth. Antennae sometimes attenuate towards their apices, with flagellum multi-articulate. Thorax generally much longer than high; sternauli always discreted and sternum very often much longer than broad between the anterior coxae; petiolar metathoracic area very rarely extending beyond centre, basal area not often complete. Abdomen with petiole usually stout, sometimes discally broadly excavate; second segment very often not transverse, with large and triangular thyridii; terebra usually stout and strongly reflexed. Legs with anterior coxae not infrequently small; tibiae sometimes short, always with curved calcaria; hind tarsi elongate with all the joints gradually decreasing in length, and base pale-marked. Wings with the stigma not very broad, generally emitting the radial nervure beyond its centre; brachial cell with its lower angle not open.

Porizon italicus, Grav. (I.E. iii. 780, ♀), was sent from Genoa by Spinola and has, almost certainly erroneously, been considered British; Marshall places it in *Thersilochus*, but no one now knows what it is. The same author's *P. rufinus* (l.c. 754, ♀) is a synonym of *Orthopelma luteolator* (cf. Ichn. Brit. ii. 111). To what genus to refer *P. linguarius*, Hal. (Ann. Nat. Hist. 1839, p. 117, ♀) I am at a loss, though its author, who says "The maxillae and labium inflected in repose extend as far as the coxae of the intermediate legs," did not intend its inclusion in *Acrodactyla*, as placed by Dalla Torre (cf. Morley, Entom. 1913, p. 262).

Thersilochus, Holmgr., comprising the two other genera of this Tribe, was at first distinguished from the present genus by having the antennae

strongly remote from each other basally, the mesosternum transverse and metathorax much shorter than high, whereas in *Porizon* it is not or but slightly shorter than high with mesosternum longer than broad and the scrobes not abnormally remote.

Table of Species.

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|-------|-----|--|--------------------------------|
| (2). | 1. | Radius forming no angle with stigma, but straight and emitted from margin; inner nervure of areolet somewhat elongate (<i>Porizon</i> , Först.) | 1. EXHAUSTATOR, <i>Fab.</i> |
| (1). | 2. | Radius forming angle with lower margin of stigma; nervure of areolet short, often punctiform. | |
| (4). | 3. | Second segment short with small thyridii. Head smooth and shining; thorax short with petiolar area extending beyond centre; anus densely pale-pubescent; legs stout with tibiae longer than metatarsi; size small (<i>Cyrtophion</i> , Thoms.) | 2. DISSIMILIS, <i>Grav.</i> |
| (3). | 4. | Second segment not short; thyridii large and triangular. | |
| (8). | 5. | Apical joint of maxillary palpi obsoletely bisarticulate, longer than penultimate; vertex not smooth. Flagellum elongate, extending beyond thorax and apically attenuate; terebra short, stout and strongly reflexed; abdomen centrally and legs red; size large (<i>Cratophion</i> , Thoms.) | |
| (7). | 6. | Centre of metathorax apically carinate; head not posteriorly constricted | 3. GRAVIPES, <i>Grav.</i> |
| (6). | 7. | Centre of metathorax not carinate; head posteriorly constricted | 4. ANGUSTIPENNIS, <i>Hlmg.</i> |
| (5). | 8. | Apical joint of maxillary palpi simple, not longer than penultimate; vertex somewhat smooth. | |
| (10). | 9. | Basal segment, especially in ♀, short and stout; hind tibiae hardly as long as metatarsi, with external setae; femora stout and subincrassate; petiolar area not extending to metathoracic centre (<i>Barycnemis</i> , Först.) | 5. CLAVIVENTRIS, <i>Grav.</i> |
| (9). | 10. | Basal segment much more slender, petiole double length of postpetiole; hind tibiae longer than metatarsi, with no setae; anterior femora not incrassate; petiolar area reaching centre (<i>Leptopygus</i> , Först.) | 6. HARPURUS, <i>Schr.</i> |

1. *exhaustator*, *Fab.*

Ichneumon exhaustator, *Fab.* Ent. Syst. Suppl. 1798, 226. *Ophion exhaustator*, *Fab.* Piez. 135; *Panz.* F.G. ix. 107, T. 8; *Gr.* I.E. iii. 1044. *Porizon hostilis*, *Gr.* lib. cit. 753, ♂ ♀ (*nec* *Holmgr.*). *P. exhaustor*, *Zett.* I.L. i. 396; *Holmgr.* Sv. Ak. Handl. 1858, p. 133, ♀; *Thoms.* O.E. xiii. 1361, ♂ ♀.

Head densely punctate and piceous-pubescent, hardly constricted posteriorly, with the vertex broad; cheeks elongate and buccate; clypeus basally discreted, apically rufescent, depressed and broadly rounded; mandibles centrally rufescent with teeth of equal length. Antennae hardly extending beyond thoracic apex, with flagellum in both sexes apically attenuate. Thorax stout; mesonotum densely punctate with the pleurae somewhat smooth, diffusely punctate and the speculum distinct; metathorax punctate, more densely towards its apex with distinct carinae from apex as far as its centre. Abdomen fusiform and red with the first segment entirely and second basally black; petiole discally deplanate, postpetiole distinctly explanate, little convex, longer than apically broad and double breadth of petiole; second segment longer than apically broad, and the distinctly reflexed terebra half length of abdomen. Legs stout and red with coxae and base of trochanters black; femora subexplanate and hind tibiae longer than metatarsi. Wings infumate piceous with the somewhat narrow stigma and the tegulae infusate; radial nervure emitted from centre of stigma and apically but slightly curved. Length, 10–12 mm.

It is said to extend throughout north and central Europe, though to be nowhere common. *Gravenhorst* took the male in a German pine wood towards the end of September; *Zetterstedt* found a female in Lapland, *Thomson* records it from Sweden, and it is known from both France and during September in Belgium, though nowhere yet bred. I should have omitted this rare species from our Fauna, as probably mixed with *P. hostilis*, *Holmgr.* (*nec* *Grav.*), were it not that I captured a female crawling sleepily in a lane at *Wherstead*, near *Ipswich*, so late in the year as October 28th, in 1898.

2. *dissimilis*, *Grav.*

Porizon dissimilis, *Gr.* I.E. iii. 774 (excl. ♀); *Zett.* I.L. i. 396, ♂. *P. agilis*, *Holmgr.* Sv. Ak. Handl. 1858, p. 134, ♀. *P. (Cyrtophion) dissimilis*, *Thoms.* O.E. xiii. 1367, ♀. *Thersilochus dissimilis*, *Holmgr.* Sv. Ak. Handl. 1858, p. 141, ♂.

Head smooth and shining, slightly constricted posteriorly, with the mandibles rufescent and palpi flavidous. Antennae filiform and a little longer than half body, with their base rufescent beneath and the first joint of the ♀ 19-jointed flagellum little longer than the second. Thorax somewhat elongate, with no mesonotal notauli; metathorax not rugosely punctate but with the petiolar area extending beyond its centre. Abdomen laterally rufescent beneath with apices of the segments usually concolorous; petiole slightly curved; postpetiole shorter than twice and a half the petiolar breadth; terebra strongly reflexed and about length of

basal segment. Legs red with the hind coxae partly black and the femora sometimes slightly infuscate: hind calcaria not longer than a third of their metatarsi. Wings slightly clouded with the stigma strongly infuscate and tegulae piceous or flavidous. Length, 3-4 mm.

Holmgren says this species resembles *P. claviventris*, but that species has the second segment twice as long as broad and the femora are much stouter and broader.

Northern and central Europe. Recorded by Marshall from Lasingham in Yorkshire (Yorks. Nat. Union Trans. 1877, p. 38); a single female at Brundall, near Norwich (Bridgman). I have seen nothing I could ascribe to this distinct species.

3. *gravipes*, Grav.

Porizon gravipes, Gr. I.E. iii. 757, ♀. *P. (Cratophion) gravipes*, Thoms. O.E. xiii. 1363, ♂ ♀. *P. hostilis*, Holmgr. Sv. Ak. Handl. 1854, p. 23, ♂; *lib. cit.* 1858, p. 132, ♂ ♀; Ofv. 1858, p. 328.

Head not constricted posteriorly, punctate and finely pubescent; frons subimpressed above scrobes; eyes small and oval; face transverse with cheeks and temples both broad and buccate; centre of mandibles and sometimes apex of clypeus rufescent. Antennae longer than half body, apically attenuate with the basal flagellar joint twice longer than broad. Thorax stout and longer than high, punctate and finely pubescent, with notauli apically distinct; metathorax of ♀ punctate and of ♂ rugose, with no basal longitudinal carinae, though basal area laterally distinct. Abdomen black with second segment except basally, the third and fourth entirely, red and the following in ♀ piceous with paler apices; central segments of ♂ usually discally infuscate; basal segment curved, with a broad sulcus to beyond centre and no lateral margin; apex of postpetiole subexplanate and sometimes partly aciculate; the second nitidulous and hardly longer than its apical breadth with basal foveae, the following glabrous and nitidulous, subemarginate with distinct sutures; terebra but slightly exserted, stout and reflexed; in ♂ the basal segment is narrower and straighter, with anal styli somewhat stout. Legs red, with coxae and trochanteral base black, and tarsi apically infuscate. Wings distinctly a little infumate, with the tegulae and large stigma nigrescent, or the former in ♂ rufescent. Length, 7-10 mm.

Central and northern Europe; rare in Thuringia; Gaulle says it has been bred from *Rhodites roseae*. I find no specific British records and can believe it to be extremely rare with us, for in the course of twenty years' collecting I have seen but three males, differing slightly *inter se*. The first was found on flowers of *Angelica sylvestris* at Foxhall, near Ipswich, on 18th September, 1902; this is 8 mm. in length with the femora and tibiae fulvous and hind tibiae basally infuscate above. The second was taken crawling in a sand pit half-a-mile away on 8th April, 1904, and is only 6 mm. in length with the hind tibiae testaceous and their femora infuscate; Mr. de la Garde has been so good as to give me an analogous male taken on 6th April, 1901, in Devonshire.

4. *angustipennis*, *Holmgr.*

Porizon angustipennis, Holmgr. Sv. Ak. Handl. 1858, p. 133; Brisch. Schr. Nat. Ges. Danz. 1880, p. 192, ♀. *P. (Ceratophion) angustipennis*, Thoms. O.E. xiii. 1363, ♂ ♀.

Head transverse, finely punctate and pubescent, posteriorly somewhat constricted. Thorax nearly thrice longer than high, cylindrical and finely punctate; metathorax, at least of ♀, somewhat smooth discally or only finely and sparsely punctate. Abdomen centrally red; basal segment subgeniculate with no longitudinal discal sulcus, lateral sulci distinct; postpetiole subglabrous; exertion of terebra as long as postpetiole and reflexed above anus. Legs red with coxae of ♀ infusate-marked and of ♂ nearly entirely black. Wings narrow and slightly infumate, with the stigma not very broad. Length, 5–7 mm.

This species is very like *P. gravipes*, but the head is posteriorly constricted, the metathorax smooth or only diffusely punctate above, the basal segment with no sulci though its lateral furrows are distinct, postpetiole not aciculate, the legs are paler and the size usually smaller. The ♂ resembles *P. harpurus*, though differing in its smoother metathorax and shorter petiole, and is easily distinguished by its longer and apically attenuate antennae, with more convex scutellum.

Sweden, Prussia, etc. With us it is certainly uncommon, and I have not met with the female, though several males were netted on the wing at Lyndhurst, Matley Bog and Pondhead in the New Forest, early in August, 1901; Tuck took one in Finborough Park in Suffolk, towards the end of the preceding August; and two more were secured on the flowers of *Angelica* at Foxhall, near Ipswich, on 5th and 25th of the following September.

5. *claviventris*, *Grav.*

Ichneumon bellator, Müll. Prodr. 1776, p. 158; Gr. I.E. iii. 995 (?). *Porizon claviventris*, Gr. lib. cit. 755; Zett. I.L. 397; Ratz. Ichn. d. Forst. iii. 91; Holmgr. Sv. Ak. Handl. 1858, p. 133; Ruthe, Stett. Ent. Zeit. 1859, p. 379, ♀. *P. (Barycnemis) claviventris*, Thoms. O.E. xiii. 1364, ♂ ♀.

Head posteriorly constricted, with vertex elevated and somewhat broad; cheeks short and frons not glittering; mandibles and apex of clypeus dull red, the latter smooth and broadly rounded. Antennae of ♀ slightly incrassate towards their apices. Thorax elongate, nearly thrice longer than high, with the pleurae finely punctate above and subnitidulous; metathorax rugosely punctate, with basal area of ♂ usually very narrow; petiolar area not extending to centre. Abdomen claviform and laterally subcompressed, with the central and sometimes also the apical segments obsoletely rufescent; basal segment, especially of ♀, short and stout; second longer than broad; terebra short and reflexed. Legs red with the anterior coxae basally, and hind ones entirely, black; hind femora often infusate and their tibiae in ♀ almost shorter than the metatarsi. Wings slightly infumate with stigma nigrescent, tegulae piceous and apical abscissa of radius double length of the basal. Length, 4 mm.

The ♂ is very like *P. harpurus*, but the petiole is shorter, the metathorax much more finely punctate and the petiolar area shorter.

Occurs from Lapland to France. Ratzeburg tells us that Bouché bred a female in Germany, which he considered to belong to this species, from *Cynips Quercus folii* (*Dryophanta folii*; *D. scutellaris*, Entom. 1880, p. 257); it is found in Belgium during July and August. Very uncommon with us, and I can find no records published; I possess four females and a male from Surrey: Shere (Capron), Abinger Hammer at the end of August, 1900 (Butler), and Reigate in July, 1872 (Saunders); to which county I should have considered it nearly restricted with us were it not that Col. Verbury has given me a single female, taken by him on 17th July, 1904, at Nairn in Scotland.

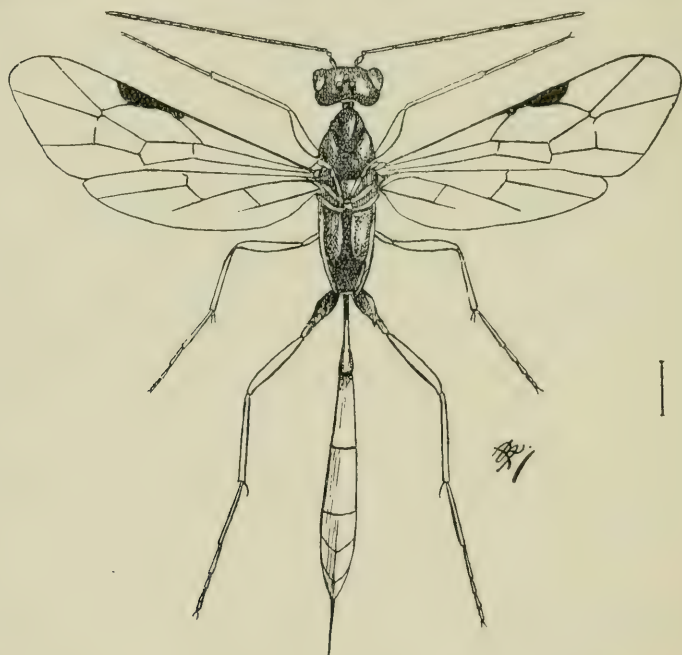
6. *harpurus*, Schr.

Ichneumon bedeguaris, Fourc. E.P. ii. 1785, 425; Oliv. Encycl. Méth. 1792, 206; *Cynipsichneumon bedeguaris*, Christ. Naturg. 1791, p. 282, pl. xli, fig. 3; *Ophion bedeguaris*, Grav. Nov. Act. Acad. 1818, p. 297 (?). *Ichneumon harpurus*, Schr. F.B. ii. 1802, 294, ♀. *Porizon harpurus*, Gr. I.E. iii. 758, ♂ ♀; Ratz. Ichn. d. Forst. ii. 87; iii. 91; Holmgr. Sv. Ak. Handl. 1854, p. 23, ♂; *lib. cit.* 1858, p. 134; Brisch. Schr. Nat. Ges. Danz. 1880, p. 192. *P. (Leptopygus) harpurus*, Thoms. O.E. xiii. 1366, ♂ ♀.

Head finely and sparsely punctate, somewhat nitidulous, little narrowed posteriorly with vertex narrow and posteriorly subemarginate; frons of ♀ shining and of ♂ somewhat dull; eyes elongate and not very prominent; temples and the rather short cheeks smooth and shining; clypeus deplanate and nitidulous, its apex together with palpi and centre of mandibles rufescent. Antennae slender and basally ferrugineous; flagellum filiform with distinctly discreted joints, of which the basal is almost longer than scape. Thorax cylindrical and stouter in ♂; mesonotum dull and finely pubescent with notauli apically visible; metathorax rugosely punctate, rougher in ♂; basal area elongate and rectangular, petiolar area entire. Scutellum laterally margined. Abdomen usually rufescent or ferrugineous from second segment, anus generally infusate or very rarely the abdomen is nearly entirely black above; of ♀ elongate fusiform and subcompressed, of ♂ strongly compressed; basal segment linear with postpetiole of ♂ twice as long as apically broad, of ♀ only half as long again; second segment twice longer than broad, with thyridii elongate; apical segments discally incised; terebra slender reflexed and shorter than first segment. Legs somewhat stout and red with coxae infusate or black; hind tibiae longer than their metatarsi, and their femora often infusate. Wings slightly clouded and a little narrow; stigma nigrescent and of normal size; tegulae flavidous or rufescent; radius apically straight. Length, 4-7 mm.

This is the commonest species of *Porizon* in Europe and extends pretty well over the whole Continent. It does not, however, appear to have been there bred since Ratz. (*loc. cit.*) recorded it from the galls of *Rhodites rosae* in Germany; considering the numbers of *Orthopelma luteolator* that have been raised from these bedeguar galls both here and abroad, it is remarkable that we, like Schm., have failed to raise this species. Lastingham in Yorks. (Marshall), Eaton near Norwich (Bridgman), Bolt Head in Devon at the end of June (Bignell). In my experience this is an abundant species throughout eastern and southern England, occurring in profusion

in woods and marshes, though the male is the commoner sex by about four to one. This has an extensive perfect existence from the middle of June to 26th September and is almost invariably found upon the umbelliferous flowers of *Heracleum*, fennel and angelica; the female, on the other hand, occurs only from the middle of July to 5th September and is usually found by sweeping, though I twice took it on angelica flowers and once on those of *Smyrnum olusatrum*. I possess it from Blackheath, Plumstead, Oxshott and Harting (Beaumont); St. Margarets in Kent (Sladen); a full series of both sexes from both Shere (Capron) and Felden (Piffard); Reigate and Greenings in Surrey (Saunders); New Forest (Miss Chawner) and Lyndhurst (Adams); Devonport (Garde); Colgate in Sussex (Newbery); Abinger Hammer in Surrey (Butler); Bungay (Tuck); Godstone in Surrey, Heacham in Norfolk and Ousden in Suffolk (Elliott); and one female from Golspie in Scotland (Col. Yerbury). The remainder of my



ninety specimens are from Huntingfield in Kent, Ventnor in Isle of Wight, and the Christchurch sandhills; from Denny Wood, Wilverly, Lyndhurst, Matley Bog, Rhinefields, Brockenhurst and Hursthill in the New Forest; and in Suffolk from Benacre Park, Bentley Woods, Alderton, Henstead marsh, Claydon, Lackford, Tuddenham Fen, Barton Mills, Brandon, Foxhall, Shotley and Aldeburgh. The late date to which the males extend in autumn, coupled to the fact that I have swept it from a hedge bottom as early as 11th April, 1898, shows that hibernation in the perfect state is not improbable. The species has not been bred in Britain from any recognised host, though Musham raised a male at Lincoln on 25th June, 1901, from mixed pupae.

DIAPARSUS. *Thomson.*

Thoms. O.E. xiii. 1369; (?) *Diaparsis*, Först. Verh. pr. Rheinl. 1868, p. 149.

Size not small. Head a little constricted behind the eyes with vertex not smooth; frons usually transversely elevated, face often strongly transverse and cheeks not very short. Antennal flagellum of ♀ with at least twenty joints, the first generally longer than the not or hardly transverse second. Thoracic notauli short but always distinct; basal metathoracic area not short, very rarely with a central carina; sternauli always distinct, more rarely abbreviated. Abdomen nearly always at least centrally red; basal segment infrequently elevated, the second longer than broad with the thyridii in both sexes elongate-triangular; terebra distinctly exerted and usually elongate. Calcaria not very short. Wings with lower angle of brachial cell closed and entire; apical abscissa of radial nervure not deflexed and at least double length of the basal.

This genus was split off by Thompson from the remaining species of *Thersilochus* of Holmgren on account of its many-jointed flagellum, small but distinct notauli, and the large elongate-triangular thyridii at base of second segment.

Table of Species.

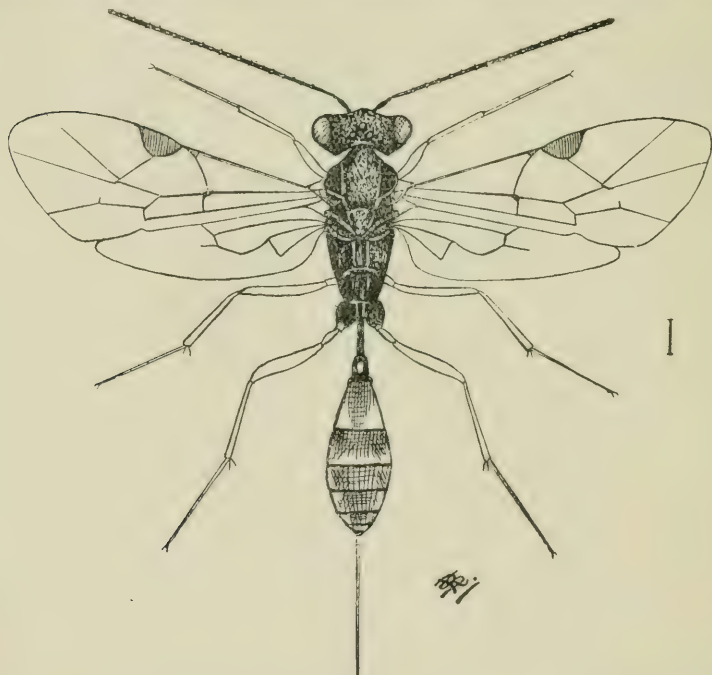
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|-------|----|---|------------------------------|
| (2). | 1. | Basal third of metathorax centrally carinate, basal area wanting; abdomen black-marked red; hind femora dark; terebra as long as abdomen; flagellum of ♀ 21-jointed | 1. GEMINUS, <i>Holmgr.</i> |
| (1). | 2. | Metathorax with no central longitudinal carina, basal area usually entire. | |
| (8). | 3. | Hind femora mainly or entirely nigrescent. | |
| (5). | 4. | Head no broader than thorax, vertex broad; flagellum of ♀ 22- and in ♂ 27-jointed; terebra straight and almost longer than abdomen; antennae basally and legs testaceous, coxae mainly dark; abdomen testaceous, basally and laterally nigrescent | 2. VERSUTUS, <i>Holmgr.</i> |
| (4). | 5. | Head broad; antennae at least 25-jointed; terebra not shorter than abdomen. | |
| (7). | 6. | Abdomen black, with central segments only laterally red; legs red, basally black; terebra slightly longer than abdomen | 3. ERYTHROSTOMUS, <i>Gr.</i> |
| (6). | 7. | Abdomen mainly red; terebra not longer than abdomen | 4. NUTRITOR, <i>Fab.</i> |
| (3). | 8. | Legs red or flavidous, usually with only hind coxae partly black. | |
| (10). | 9. | Eyes apically divergent, <i>i.e.</i> face apically explanate; eyes and ocelli very large; head not narrowed behind, with vertex broad; antennae basally pale and apically attenuate | 5. GILVIPES, <i>Grav.</i> |

- (9). 10. Eyes parallel, *i.e.* face not explanate; eyes and ocelli of normal size.
 (12). 11. Legs with at least hind coxae entirely black 6. *RUFIPES*, *Holmgr.*
 (11). 12. Legs with hind coxae at most basally infusate 7. *MICROCEPHALUS*, *Grav.*

1. *geminus*, *Holmgr.*

Thersilochus geminus, *Holmgr.* Sv. Ak. Handl. 1858, p. 137, ♀; Marsh. Ent. Ann. 1874, p. 144, ♂ ♀. *Diaparsus geminus*, *Thoms.* O.E. xiii. 1371, ♂ ♀.

Head short and transverse, finely punctate and nearly dull, slightly constricted posteriorly; temples nitidulous and somewhat smooth; palpi,



mandibles and apex of clypeus rufescent flavidous. Antennae with ♀ flagellum 21-jointed. Thorax strongly convex and little longer than high, slightly shining and both finely and closely punctate; metathorax short and rugosely punctate; basal area laterally carinate; petiolar area subvertical and discreted throughout. Abdomen testaceous and laterally compressed, with its base to the second or third segment black; first segment narrow and much longer than the hind coxae and trochanters, with postpetiole convex; second a little longer than broad and terebra as long as abdomen. Legs testaceous with the anterior coxae entirely or basally, and whole of the hind coxae and trochanters and femora, nigrescent. Wings slightly clouded with the stigma infusate and not large; tegulae ferrugineous. Length, 4-5 mm.

An uncommon species in central Sweden, occurring also in Germany. Marshall first discovered the male, which he says differs only sexually from the female, and introduced the species as British (Ent. Ann. 1874, p. 144) from Darent Wood in Kent. I took a single typical female with unicarinate metanotum on bracken at the Wilverly Inclosure in the New Forest on 9th July, 1909. Another female, swept at Farnham in Suffolk on 6th June, 1900, and three in Capron's Surrey collection, I cannot consider distinct, though the basal metanotal area is entire and terebra a trifle shorter. During June, 1909, Atmore took a very large but otherwise quite typical female of six and a half millimetres at Kings Lynn in Norfolk.

2. *versutus*, Holmgr.

Porizon minor, Gr. I.E. iii. 768, ♀; Zett. I.L. i. 1838, 396, ♂ (?). *Thersilochus versutus*, Holmgr. Sv. Ak. Handl. 1858, p. 141, ♂ ♀. *Diaparsus versutus*, Thoms. O.E. xiii. 1376, ♂ ♀.

Head somewhat shining, almost narrower than thorax, hardly constricted posteriorly, with the vertex broad, mandibles centrally flavous and clypeus apically rufescent. Antennae infusate and paler beneath with the three or five basal joints entirely testaceous; flagellum of ♀ 22-jointed and of ♂ 27-jointed. Thorax stout with the basal area indistinct; mesopleurae somewhat shining and finely punctate. Abdomen testaceous and laterally compressed with basal segment black, the second usually badious and the following laterally, rarely also discally, infusate and the ♂ anus not infrequently nigrescent; first segment a little longer than hind coxae and trochanters, in ♀ nearly straight and finely aciculate; postpetiole smooth and shining; second segment longer than broad; terebra longer than abdomen and nearly straight. Legs testaceous with the hind coxae and femora nigrescent, their tarsal joints and sometimes the anterior coxae infusate. Wings infumate with stigma piceous, tegulae flavidous and radius apically straight. Length, 3-4 mm.

Thomson says it ranges through north and central Europe, though it is absent from most lists; Boheman first took it sparingly in southern Lapland during the middle of August. Bridgman took it at Earham near Norwich in August and September; and Bignell records *Porizon minor*, Gr., from Exeter, where it was captured on 2nd September.

3. *erythrostomus*, Grav.

Porizon erythrostomus, Gr. I.E. iii. 760, ♂ ♀. *Diaparsus erythrostomus*, Thoms. O.E. xiii. 1374, ♀.

Head with the vertex broad and not posteriorly constricted; frons dull and finely punctate, with temples nitidulous and cheeks subbuccate; mouth rufescent. Thorax dull and finely pubescent with distinct notauli; metathorax rugosely punctate with basal area elongate-quadrate. Abdomen black with the second segment laterally and usually also the three following rufescent, or in ♀ the second segment alone red; basal segment slender and in ♂ sublinear, with postpetiole of ♀ a little longer and in ♂ twice as long as broad; terebra longer than abdomen and

slightly reflexed. Legs testaceous; anterior coxae basally and rarely entirely, sometimes and especially in ♂ the femora also basally, black; hind legs black with tibiae and femoral apices, sometimes also tarsi, rufescent. Wings slightly clouded, with the broad stigma nigrescent, tegulae rufescent and branch of the radial cell somewhat short. Length, 6 mm.

This species and *D. nutritor* have the head broad, the antennae at least 25-jointed and the hind femora dark; the present may be recognised by its elongate terebra, infusate abdomen and the short branch of the radial alar cell.

At present only known from England, France and Belgium. Bignell, so lately as 1898, records *Porizon erythrostomus*, Gr., from Bickleigh in Devon, 9th July, on Bridgman's authority. Thomson described it from England. Certainly rare with us and hardly likely to be overlooked in its stout conformation, elongate terebra and centrally bright red abdomen; I have only taken four males upon two occasions on white poplar in the Bentley Woods at the end of May, 1900 and 1902. In Capron's collection is another male, which has the postpetiole malformed and very large spiracles, together with four females, only one of which has the hind femora dark; these are from Surrey.

4. *nutritor*, Fab.

Ophion nutritor, Fab. Piez. 1804, 139; Gr. Nov. Act. Acad. 1818, p. 297. *Ichneumon nutritor*, Thunb. Bull. Acad. Petersb. 1822, p. 263; Mem. 1824, p. 316. *Porizon nutritor*, Gr. I.E. iii. 762, ♂ ♀. *Diaparsus nutritor*, Thoms. O.E. xiii. 1373, ♂ ♀.

Head with the vertex broad and not posteriorly constricted; frons dull, densely and finely punctate; temples nitidulous and cheeks subbuccate; clypeus and mandibles rufescent with upper tooth of latter the longer. Antennae elongate with at least 30 flagellar joints, of which the basal are distinctly discreted and the first little longer than the cylindrical second; scape usually rufescent beneath; flagellum of ♀ filiform and of ♂ apically subattenuate. Thorax densely pubescent and almost dull with distinct notauli; metathorax finely and rugulose punctate with basal area elongate-quadrate; pleurae somewhat shining, diffusely punctate above, with lateral sulci superficial. Abdomen fusiform with first segment black and remainder testaceous with second usually piceous and the following generally indefinitely infusate laterally; basal segment somewhat broad and longitudinally sulcate; terebra as long as abdomen. Legs rufescent with coxae black and the front one apically or entirely red; hind femora usually nigrescent with only their extremities red. Wings slightly clouded with tegulae ferrugineous or black and radial cell as long as the incrassate, nigrescent stigma with its branch extending nearly to apex of wing; radius emitted beyond centre of stigma and recurrent nervure nearly continuous. Length, 6-7 mm.

Distributed throughout most of Europe and bred by Dr. Giraud from *Balaninus villosus* (Ann. Soc. France, 1877, p. 403). It has long stood in the British list, but there are no records of localities and I have not met with this species.

5. *gilvipes*, Grav.

Porizon gilvipes, Gr. I.E. iii. 767, ♀. *Diaparsus gilvipes*, Thoms. O.E. xiii. 1378, ♂ ♀. *Allophrys gilvipes*, Szépl. Ann. Mus. Nat. Hung. 1905, p. 529, ♂ ♀.

Head not posteriorly constricted, with vertex broad and not transversely convex; eyes apically divergent and very large, as also are the ocelli, especially in ♂; temples and cheeks buccate, finely rugose and somewhat dull; mouth rufescent. Antennae basally rufescent; flagellum not stout, apically slightly attenuate, of ♀ with eighteen or nineteen and of ♂ with twenty-two joints; the first half as long again as the cylindrical second. Thorax with deeply impressed notauli; metathorax not rugose, with basal area elongate-quadrate and costae weak; pleurae finely and rugosely punctate or in ♂ almost smooth; sternauli deep, curved and slightly crenulate. Abdomen elongate fusiform, laterally compressed; castaneous with first segment black and the remainder laterally rufescent and apically rufescent flavidous; basal segment somewhat stout, sulcate; terebra as long or nearly as long as abdomen. Legs somewhat stout and usually entirely testaceous, rarely with the hind coxae basally or entirely piceous. Wings hyaline with the nervures and broad stigma rufescent; tegulae flavidous or piceous; radial branch extending nearly to apex of wing; recurrent nervure subcontinuous. Length, 6-7 mm.

This is distinguished from all other species of this genus by the apically explanate face and by the peculiarly large eyes and ocelli.

Freiburg, northern Germany and Denmark; bred from a species of *Hallom-nus* (Thomson). It was introduced as British by Marshall in his 1870 Catalogus, but no one has recorded it and I do not know it.

6. *rufipes*, Holmgr.

Thersilochus rufipes, Holmgr. Sv. Ak. Handl. 1858, p. 145, ♂ ♀. *Diaparsus rufipes*, Thoms. O.E. xiii. 1377, ♂ ♀.

Head transverse, little nitidulous and somewhat constricted posteriorly; mouth and clypeus testaceous with the latter smooth and apically broadly rounded. Antennae somewhat stout; flagellum 24-jointed in ♂ and 22-jointed in ♀, whose antennae are basally testaceous beneath. Thorax stout and somewhat shining with basal area often incomplete; pleurae centrally smooth, with deeply impressed and slightly crenulate sulci. Abdomen laterally compressed and entirely black with only the second segment partly badious, though Thomson gives the abdomen as piceous with basal segment black and the third apically red; basal segment slightly curved and longer than hind coxae and trochanters, second hardly longer than broad, and terebra distinctly shorter than abdomen. Legs testaceous with the hind coxae black and base of front ones rarely piceous. Wings hyaline with stigma infusate, tegulae dull flavidous and radius apically straight. Length, 5-6 mm.

Holmgren's variety with terebra as long as abdomen and only basally infusate hind coxae will probably prove to be a good species.

France (Gaulle), Belgium in July and August (Josquinet), Sweden (Thomson) and southern Lapland (Holmgren). It appears somewhat spasmodic in its appearance with us for Bridgman says "At the end of

August and September I took the small *Thersilochus rufipes*, hitherto unrecorded as British; I have never met with it before, but this year I took two females, and the males were so plentiful that I often had more than a score in the net at a time" (Trans. Norf. Soc. v. p. 64), at Earlham near Norwich (*l.c.* 1894, p. 623). In my experience, however, this is a spring species, and I have only once taken a pair in cop. on flowers of angelica near Southwold in the autumn and these I believe to be distinct. I have it from Shepton Mallet, Somerset, in May (Charbonnier); Shere, Surrey (Capron); Feldon in Herts (Piffard); Tostock and Bungay in June (Tuck) and Ipswich on 3rd May (Platten). It almost certainly hibernates for I have beaten it from spruce in Bentley Woods as early as 13th March; it occurs there and in Assington Thicks on birch in May, when I have also swept it at Bramford, Icklingham and Brandon staunch; in June the female has been beaten from willow at Upware in the Cambridgeshire fens.

7. *microcephalus*, Grav.

Porizon microcephalus, Gr. I.E. iii. 766, ♀. *Diaparsus microcephalus*, Thoms. O.E. xiii. 1375, ♂ ♀. *Thersilochus xanthopus*, Holmgr. Sv. Ak. Handl. 1858, p. 138, ♀. (?) *T. microcephalus*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 193, ♂ ♀.

Head small, somewhat shining, little constricted posteriorly, with vertex broad; palpi, mandibles and apex of the smooth clypeus testaceous. Antennae rather longer than half body and basally testaceous; flagellum 26-jointed with the first longer than second joint. Thorax coarctate, subnitidulous and little longer than high; metathorax somewhat smooth and shining with the basal area incomplete. Abdomen laterally compressed and black with the second segment entirely or apically and the following at least laterally rufescent; basal segment slender and elongate, the second longer than broad and terebra not shorter than abdomen. Legs entirely testaceous, with tarsi alone apically subinfusate. Wings hyaline with the broad stigma piceous and tegulae flavidous; radial branch extending nearly to apex of wing; recurrent nervure sub-continuous. Length, 5 mm.

The conformation of this species resembles that of *Thersilochus moderator*, especially in its gibbous thorax, in consequence of which Schm. here synonymises *T. xanthopus* in place of *T. pallidipes*, Holmgr., as given by Thomson in 1889; and he also queries the synonymy of Brischke's insect, whose thorax is said to be "fast cylindrisch." The pale fulvous abdomen and legs with at most their base alone black, together with the ♀ slender form and elongate terebra, which is not or hardly shorter than the abdomen, are distinctive. I possess a female named *D. versutus* by Dr. Sigismund Brauns, but in that species the hind femora are dark and the ♀ flagellum but 22-jointed.

Silesia, Sweden, Holland and France to central Germany. Our only authentic record is that of an example named by Bridgman and captured by Bignell at Longbridge in Devon on 24th August. This species is, however, not very uncommon with us, and I possess it from Gomshall in August, 1899 (Butler); a dozen females from Shere (Capron); Bishops Teington and Botusfleming (Marshall); Marvel Copse in Isle of Wight in October (Newbery); Feldon in Herts (Piffard) and both sexes from Bungay in Suffolk (Tuck). It is quite an autumn species, rarely seen

before the end of August and extending in Hampshire into October. It has occurred to Lyle and me, almost always on the flowers of *Daucus carota* or *Angelica sylvestris* at Matley Bog in the New Forest and in Suffolk at Claydon Bridge, Barnby Broad, Henstead Marsh, Tuddenham Fen, Bentley Woods, Wenhaston marshes and Holbrook, as late as the 24th September. I first took the female on the water of a horse-trough in Ipswich; and have obtained males at Chippenham Fen in Cambs. and Ringstead in Norfolk.

THERSILOCHUS, *Holmgren.*

Holmgr. Sv. Ak. Handl. 1858, p. 135; Thoms. O.E. xiii. 1378.

Head not or hardly broader than thorax, extremely finely punctate, and equally rarely with the ♂ eyes and ocelli very large. Antennae with the flagellum sometimes pauci-articulate. Thorax with notauli obsolete or wanting; basal metanotal area not rarely simply indicated by an elevated costa; sternauli sometimes obsolete or wanting. Abdomen often with the second segment transverse, its thyridii always small and punctiform. Legs with the tibial calcaria small and short. Wings with the branch of the radial nerve very rarely extending to apex of wing; apical lower angle of the brachial cell sometimes open, *i.e.*, with its nervure wanting; recurrent nervure very rarely entirely wanting, and not infrequently emitted before the areolar nervure.

I here employ this genus in the sense used by Thomson, separating from Holmgren's genus only those species which were placed by the former in his *Diaparsus*. Recent Continental authors have raised Förster's divisions into genera and, doubtless, as more and more species are published it may be necessary to thus adopt them, however little stability they contain; but, at present in Britain, our fauna is not sufficiently known to render their retention at all necessary; for, in reality, their use is as well exemplified in specific as in generic division. I have not placed *Porizon fulvipes*, Grav., relegated to this genus by Marshall, because it is known by a single Nuremberg ♀ only, and our claims are visionary.

Table of Species.

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|------|----|--|-------------------------------|
| (2). | 1. | Discoidal cell apically open, through the recurrent nervure being incomplete; metathorax with basal longitudinal costa in place of basal area; body small and black, legs dark; recurrent nervure partly present; head not glittering; terebra shorter than abdomen (ANEUCLES, <i>Fst.</i>) | 1. MELANARIUS, <i>Holmgr.</i> |
| (1). | 2. | Discoidal cell entire, with recurrent nervure subcomplete. | |
| (4). | 3. | Eyes of ♂ very large, hemispherical; temples constricted; head of ♀ normal; metapleural spiracles remote from metapleurae (ALLOPHRYS, <i>Fst.</i>) | 2. BOOPS, <i>Grav.</i> |
| (3). | 4. | Eyes of normal size in both sexes. | |

- (6). 5. Basal or lateral areae, usually whole metanotum, smooth and shining (ISCHNOBATIS, *Fst.*) 3. NIGRITULUS, *Grav.*
- (5). 6. Metanotum with no smooth areae, always roughly sculptured.
- (12). 7. Antennae short, rarely with more than twenty joints; recurrent nervure usually continuous or emitted before areolar nervure.
- (11). 8. Antennae of ♀ with twelve or fourteen joints, of ♂ with as many as sixteen; basal five flagellar joints strongly elongate; basal area quadrate or wanting; abdomen sometimes centrally dull red; small spp. (PHRADIS, *Fst.*)
- (10). 9. Basal metanotal area quadrate; flagellum of ♀ 12-jointed; coxae and scape black 4. MINUTUS, *Bridg.*
- (9). 10. Basal metanotal area wanting; flagellum of ♀ 14-jointed; legs and scape fulvous 5. NITIDUS, *Bridg.*
- (8). 11. Antennae with basal joints not strongly elongate; stigma broad; parallel nervure emitted below centre of brachial cell; basal abscissa of hind wing radius much longer than cubital transverse nervure (ISURGUS, *Fst.*) 6. MORIONELLUS, *Holmgr.*
- (7). 12. Antennae more or less elongate, always with more than twenty joints; recurrent nervure emitted beyond areolar nervure; basal metanotal area entire, its spiracles close to its lateral carinae (THERSILOCHUS, *s.s.*)
- (14). 13. Flagellum stout, 20—22-jointed; legs elongate, hind ones stout; vertex broad and cheeks long; metathorax rugose; abdomen centrally red, about double length of terebra 7. TRIANGULARIS, *Gr.*
- (13). 14. Not so.
- (26). 15. Head almost broader than thorax, narrowed behind; basal flagellar joint distinctly longer than second; abdomen usually pale-marked.
- (19). 16. Legs entirely flavous or testaceous; antennae entirely or basally pale.
- (18). 17. Antennae and abdomen except first segment testaceous; terebra nearly as long as abdomen 8. RUFIVENTRIS, *Brisch.*
- (17). 18. Antennae basally flavous; second segment and sides of following red; terebra a little shorter 9. TRUNCORUM, *Holmgr.*
- (16). 19. Legs with at least the hind coxae black.
- (25). 20. Abdomen in part distinctly pale-marked.

- (22). 21. Terebra shorter than basal segment; radial branch extending nearly to apex of wing; stigma entirely black; apex of second segment and sides of following red . . . 10. MARGINATUS, *Bridg.*
- (21). 22. Terebra longer than basal segment; radial branch short; thorax short, stout, dull and laterally pubescent.
- (24). 23. Basal metanotal area entire; terebra hardly longer than basal segment . . . 11. JOCATOR, *Fab.*
- (23). 24. Basal area unicariniiform; terebra nearly half length of abdomen . . . 12. CARINATUS, *Bridg.*
- (20). 25. Abdomen only obsoletely dull rufescent laterally; terebra as long as abdomen; antennae basally testaceous . . . 13. ORCHESIAE, *Morl.*
- (15). 26. Head not or hardly narrowed behind; basal flagellar joint hardly longer than second; abdomen usually black.
- (28). 27. Antennae black with at most underside of scape pale; femora partly black; stigma not unusually large; radius not incrassate at areolar nervure . . . 14. MODERATOR, *Holmgr.*
- (27). 28. Antennae basally flavous; terebra short; pleurae finely rugose; sternauli wanting; legs pale, coxae black . . . 15. SALTATOR, *Fab.*

1. melanarius, *Holmgr.*

Thersilochus melanarius, Holmgr. Sv. Ak. Handl. 1858, p. 139; Thoms. O.E. xiii. 1380, ♂ ♀. *Isurgus diversus*, Szépl. Term. Füz. 1899, p. 241, ♂; *Aneucilus melanarius*, Szépl. Ann. Mus. Hung. 1905, p. 529, ♂ ♀.

Head a little broader than thorax and almost linseed-shaped, with vertex very short and strongly constricted posteriorly; cheeks longer than mandibular base and not buccate, clypeus nitidulous and apically rounded; ♀ with mandibles and clypeal apex, ♂ with only centre of mandibles, rufescent. Antennae not extending beyond thorax; flagellum of ♀ basally rufescent beneath with about sixteen joints, of ♂ entirely black with nineteen joints, first joint as long as second, penultimate subtransverse and the last, at least of ♀, large and conical. Thorax narrower than head with mesonotum hardly shining and notauli wanting; metathorax rugosely punctate with petiolar area extending beyond centre and in ♀ usually distinctly discreted; pleurae finely rugose with no longitudinal sulci. Abdomen laterally compressed, with second segment of ♀ sometimes badius; basal segment slender, in ♂ linear and in ♀ apically explanate; second subtransverse and terebra a little shorter than abdomen. Legs somewhat slender, testaceous with the coxae black, hind femora badius or nigrescent, and their calcaria short. Wings hyaline; stigma somewhat large, piceous and both basally and apically paler; tegulae flavidous; areolar nervure rather short and recurrent emitted beyond it. Length, 3-5 mm.

One of the commonest species in northern and central Europe during August. Bred, according to Fitch (Entom. 1880, p. 257), from galls of *Cynips Kollari*. It must be rare with us for, beyond several females and a male unnamed in Capron's Surrey collection, I have seen only a couple of males, which I took on sawfly in Wicken Fen in Cambs on 10th June, 1902, and on birch bushes in Bentley Woods near Ipswich a week later.

2. *boops*, Grav.

Porizon boops, Gr. I.E. iii. 776; Ratz. Ichn. d. Forst. iii. 91; Holmgr. Sv. Ak. Handl. 1854, p. 23, ♂ ♀. *Thersilochus boops*, Holmgr. lib. cit. 1858, p. 145; Thoms. O.E. xiii. 1389, ♂. *Allophrys boops*, Szépl. Ann. Mus. Nat. Hung. 1905, p. 529, ♂.

Head somewhat shining, little constricted posteriorly, with eyes of normal size and somewhat remote from ocelli; face short and transverse; clypeus distinctly discreted, somewhat smooth and shining, apically broadly rounded; palpi and mandibles piceous or rufescent. Antennae subincrassate towards their apices, with fourteen or fifteen flagellar joints of which the third is a little longer than broad. Thorax subnitidulous and convex, little longer than high; basal area narrow and not very distinct. Abdomen black, oval, rather stout and centrally broad; basal segment slightly curved, little longer than hind trochanters; second short, transverse and sometimes badious; remainder not distinctly separated; terebra about a third the abdominal length. Legs testaceous with coxae and trochanters nigrescent. Wings lacteous-hyaline with the large stigma infusate and tegulae dull ferrugineous; branch of radial cell short and recurrent emitted beyond the subelongate areolar.

The ♂ differs somewhat considerably: Head large and distinctly constricted posteriorly, with the eyes very large and granulate; ocelli small and subcontiguous with the eyes; face strongly explanate apically, temples pubescent and the shining clypeus apically slightly elevated. Antennae slender and shorter than ♀, usually with thirteen or fourteen distinct flagellar joints. Abdomen laterally strongly compressed, with basal segment sublinear. Legs with the hind femora and usually also base of the anterior infusate or nigrescent. Wings with radius incrassate at its junction with areolar nervure. Length, 3-4 mm.

The ♀ is very similar to *Thersilochus saltator*, though stouter and with fewer flagellar joints; the unusually large and granulate eyes of the ♂ resemble those of *Diaparsus gilvipes*, though the species differ in all other particulars.

Gravenhorst knew three specimens, a male taken in a Gottingen garden towards the end of May, another reared by Nees from a larva of the heteromerous beetle, *Hallomenus (Carida) affinis*, "in Boleto fomentario habitante," during June, and a female among *Aphides* on foxglove during May. Holmgren found it on sawfly blossom at the beginning of May in Sweden; and Schm. finds it there very early in the year in Thuringia. In Belgium it occurs in July and August, and the species may be expected to occur during the same months with us, though there are no records since Desvignes instanced it as represented in the British Museum in 1856.

3. *nigritulus*, Grav.

Porizon nigritulus, Gr. I.E. iii. 782, ♀. *Thersilochus (Ischnobatis) nigritulus*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 194, ♀.

Head obsoletely nitidulous and not posteriorly constricted; clypeus shining and mouth rufescent. Antennae 13-jointed with the scape entirely or beneath rufescent. Thorax almost cylindrical, with notauli wanting and sternauli incomplete; metathorax with two nitidulous basal areae. Abdomen immaculate black, with basal segment little longer than hind coxae and trochanters, petiole slender, second segment with the thyridii small and terebra but slightly longer than half abdomen. Legs testaceous with coxae and trochanters black; anterior femora basally infuscate, hind ones nigrescent with apices pale; hind tibiae apically infuscate and, like their femora, not incrassate. Wings hyaline with stigma piceous and tegulae flavidous; radial nervure apically straight, costa not extending to apex; recurrent nervure and brachial cell entire. Length, 3 mm. ♂ unknown.

This description is drawn from the authors cited, but Brischke was by no means satisfied that his female was identical with the original one; and Thomson (p. 1382) thought possibly his Swedish *T. apertus* might belong to it.

Berlin (Grav.); Prussia (Brischke). I have seen no member of this Tribe with basally glittering metanotum; the present species was introduced as British in 1870 by the Rev. T. A. Marshall, but there are no records.

4. *minutus*, Bridg.

Thersilochus minutus, Bridg. Trans. Ent. Soc. 1889, p. 431; Thoms. O.E. xiii. 1385, ♂ ♀. *Phradis minutus*, Szépl. Ann. Mus. Nat. Hung. 1905, p. 530, ♂ ♀.

Head posteriorly constricted with vertex somewhat narrow; cheeks and palpi short, temples dull, clypeus discreted and apically rounded; mandibles rufescent and palpi piceous. Antennae not extending beyond thorax, flagellum of ♀ with eleven and of ♂ with fifteen joints, of which the five basal are elongate, the first at least double length of scape, following gradually becoming shorter, the penultimate not transverse and the last acuminate. Thorax somewhat short with mesonotum dull and both notauli and sternauli wanting; metathorax very finely and rugosely punctate; basal area narrow and often indistinct, petiolar area hardly impressed and pleurae with no sulci. Abdomen immaculate black and laterally compressed; basal segment elongate, linear and little curved; second not transverse and the terebra slender, curved and as long as abdomen. Legs rufescent, with coxae and trochanters black; anterior femora basally, and hind ones except at apex, piceous or nigrescent; hind tibiae apically infuscate. Wings hyaline with stigma somewhat broad; apical radial abscissa straight and nearly double length of basal, with its branch short; discoidal cell apically subacute below; recurrent nervure emitted slightly before the very short areolar, rarely subcontinuous. Length, 2-2.5 mm.

Thomson knew it from Lund, Germany, and England, where both sexes were first captured about Sherre in Surrey by Dr. Capron and the types are

now in my collection, together with a full series from the same source. Tuck and I have taken a very few females by sweeping and on flowers of *Heracleum sphondylium* at Tostock, Farnham and Southwold in Suffolk; and I have one from Piffard's Felden collection; these were captured between the beginning of June and of July.

5. *nitidus*, Bridg.

Thersilochus nitidus, Bridg. Trans. Ent. Soc. 1889, p. 430, ♀.

A shining badious-black species. Head transverse, broader than thorax and subdilated behind the eyes. Antennae about three-quarters as long as the body, with scape and part of basal flagellar joints fulvous; flagellum apically subclavate, with fourteen joints in both sexes of which the first is once and a half longer than broad, and about a quarter longer than the second; all joints longer than broad. Thorax with mesonotum nitidulous and obsoletely punctate; metathorax with no trace of areae. Abdomen hardly as long as head and thorax; basal segment short and about twice and a half longer than broad, nearly straight, only slightly narrower at base than apex, with distinct and subcentral spiracles; second segment transverse and apically as broad as thorax; anal segments subcompressed; terebra slightly reflexed and hardly longer than first segment. Legs somewhat slender and entirely fulvous, or with hind coxae, etc., infusate. Wings with tegulae black; stigma and nervures subtestaceous infusate; radial nervure apically curved. Length, 1.5–2 mm.

"This very small insect might almost form a separate genus: the 1st segment of the abdomen is shorter and thicker than usual," says its author, who does not compare it with his *T. minutus*, placed by Szépligeti in the subgenus *Phradis*. This species and *T. carinatus* have hitherto been ignored by Continental authors, because they were not referred to in Thomson's 1889 paper.

The male has not before been described, but differs only sexually from the female.

The hitherto unique female was captured by the Rev. T. A. Marshall in Britain, though no locality is indicated. I have only once met with this species, which must be extremely local or retiring; on the 14th June, 1900, both sexes in about equal proportion were in the utmost profusion on the flowers of mustard (*Brassica sinapistrum*) growing among turnips (*B. rapa*) in a field at Cavendish in Suffolk, where they may be suspected of preying upon *Ceuthorrhynchus pleurostigma* or some allied weevil subsisting upon one or both of these plants.

6. *morionellus*, Holmgr.

Thersilochus morionellus, Holmgr. Sv. Ak. Handl. 1858, p. 139; Thoms. O.E. xiii. 1386, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 193, ♂. *Isurgus morionellus*, Szépl. Ann. Mus. Nat. Hung. 1905, p. 531, ♀.

Head slightly shining and as broad as thorax with vertex broad and both slightly and roundly elongate posteriorly; temples dull and cheeks short; clypeus distinctly discreted, apically truncate and, with mandibles and palpi, flavidous. Antennae not extending beyond thorax, infusate

with their base usually piceous or rufescent; flagellum of ♀ with fourteen or fifteen joints, of which the first is as long as second and the apical large, subconical. Thorax dull and somewhat convex; metathorax not rugose, with basal area quadrate and pleurae finely rugose with no sulci. Abdomen immaculate black and laterally compressed, with basal segment rather short, nearly straight and dull; the second not transverse; terebra slender and little more than half length of abdomen. Legs testaceous, with coxae and trochanters black; anterior femora often basally, and the hind ones not infrequently mainly, infusate. Wings hardly clouded, with stigma infusate; apical abscissa of radius straight and nearly twice length of the basal, with short branch; recurrent nervure emitted before the very short areolar. Length, 3 mm.

Brischke does not tell us that the male, hitherto known to him alone, was bred along with the female; if it were, the association would be complete; he simply remarks (*loc. cit.*): Beim ♂ sind die Schenkel gewöhnlich heller als beim ♀. The male is not, however, uncommon in England; it differs from the female only in the possession of seventeen flagellar joints and somewhat paler legs.

Only known from Sweden, France and Prussia, where Brischke bred it from the clavicorn beetle, *Meligethes aeneus*, which abounds throughout Britain. Nevertheless, this species needed confirmation as British; its claim to inclusion in our fauna rested upon a specimen captured by Bridgman during June at Brundall near Norwich (Trans. Norf. Soc. 1894, p. 623), which he queries because the flagellum possessed but thirteen joints; several of mine also have only that number. Not uncommon with us though difficult to determine, except by the number of flagellar joints. Garde has given me the female from Chatham in May; Tuck, Platten and I have constantly taken both sexes in equal proportion in Suffolk, always in May and June, usually by sweeping but also on house-windows and whitethorn blossom at Bentley, Monk Soham, Tuddenham Fen, Tostock, Ipswich, Bawdsey and once, on 29th June, 1903, I found a female actually in a ground fungus in the Raydon Woods; I have also swept it in Roydon Fen near Diss, in Norfolk.

7. *triangularis*, Grav.

Ophion triangulare, Gr. Vergl. Ubers. Zool. Syst. 1807, p. 269. *Porizon triangularis*, Gr. I.E. iii. 781, ♀. *Thersilochus triangularis*, Thoms. O.E. xiii. 1399, ♂ ♀; (?) Brisch. Schr. Nat. Ges. Danz. 1880, p. 193, ♂ ♀.

Head subcubical with vertex broad; frons transversely convex and inflated round ocelli; temples dull, cheeks elongate and clypeus more or less discreted; mouth red. Antennae stout with flagellum of ♀ about 20-jointed and of ♂ about 22-jointed, of which the first is little longer than the quadrate second. Thorax dull with the metathorax rugose; sternauli distinct, basal area elongate-quadrate and not very distinct. Abdomen black with sides of second segment sometimes rufescent below; basal segment elongate and nearly straight, the second subtransverse, and terebra shorter than first segment. Legs red with the trochanters and dull coxae black; hind femora, except apically, piceous or nigrescent. Wings small and hyaline, with stigma infusate and tegulae testaceous;

radial branch at least in ♂ extending to apex of wing; recurrent nervure emitted beyond areolar; nervellus somewhat oblique. Length, 3.5–4 mm.

Schmiedeknecht here synonymises *T. frontellus*, Holmgr. et Brisch., but I consider it extremely doubtful if the former author described the present species and Brischke is not likely to have done so on the same page as *T. triangularis*, his account of which itself agrees none too closely with the original description.

Germany, Sweden and bred in France from *Ceuthorrhynchus Roberti* (Gaulle). Bridgman found it at Hethersett and Norwich during May and June; Bignell at Bovisand in Devon on 25th June.

8. *rufiventris*, Brisch.

Thersilochus rufiventris, Brisch. Schr. Nat. Ges. Danz. 1880, p. 196, ♀. *T. flavicornis*, Thoms. O.E. xiii. 1391, ♀.

Head almost broader than thorax, dull and posteriorly constricted, with the palpi, mandibles and clypeal apex rufescent. Antennae rufescent and extending to thoracic apex, slender with the first flagellar joint longer than the second. Thorax dull with basal metathoracic area distinct. Abdomen testaceous with only the first segment basally black; basal segment curved, longer than hind coxae and trochanters; the second and third discally broad, with former transverse and the following laterally compressed; terebra as long as abdomen. Legs entirely testaceous. Wings with radix and tegulae flavous; apical abscissa of radial nervure straight, recurrent emitted beyond the areolar, and nervellus distinctly oblique. Length, 3 mm. ♂ unknown.

Sweden, Prussia and repeatedly taken by Schm. in Thuringia. *T. flavicornis* is introduced by Bridgman (Trans. Ent. Soc. 1889, p. 431) on the strength of a male he bred from the galls of *Nematus gallicola* at Eaton near Norwich and another captured in the same locality.

9. *truncorum*, Holmgr.

Porizon jocator, var. 2, Gr. I.E. iii. 771, ♂. *Thersilochus truncorum*, Holmgr. Sv. Ak. Handl. 1858, p. 136; Thoms. O.E. xiii. 1393, ♂ ♀. *T. (Gonolochus) truncorum*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 193, ♀.

Head almost broader than thorax, dull and posteriorly constricted; cheeks short; clypeus distinctly discreted, smooth, shining and apically, together with palpi and mandibles, rufescent. Antennae slender and basally testaceous, with third flagellar joint a little longer than broad. Thorax strongly convex with mesopleurae shining and but very finely rugulose; sternauli distinct and entire; metathorax scarcely rugose, with basal area usually incomplete, but petiolar always distinct. Abdomen with second segment entirely and remainder laterally red; of ♂ strongly and of ♀ slightly compressed; second segment of ♀ transverse and of ♂ a little longer than broad; terebra as long as basal segment. Legs entirely testaceous. Wings hyaline with the stigma piceous and tegulae flavidous; radial branch extending to apex of wing. Length, 3–3.5 mm.

This species closely resembles *T. jocator*, but it is at once known by the entirely pale legs, more slender antennae, apically indicated notauli,

more nitidulous pleurae and the length of the radial branch; in conformation it is similar to *Diaparsus* though the abdomen is more coarctate and the thyridii are distinctly small.

Belgium in July and August, France, Prussia and on tree-trunks in central and southern Sweden. Bignell tells us (Ichn. of S. Devon, 38) that he captured this species on 2nd September at Exeter. On 24th August, 1908, I took on the flowers of *Angelica sylvestris* growing in the open marshes of Barnby Broad in north Suffolk five females which I can ascribe to nothing but the present species, though they differ somewhat materially in having the scape and the 18-jointed flagellum—no author states the number of joints—entirely testaceous and very distinctly stout, though agreeing with Thomson's account in being all well discreted; the terebra, too, if not unnaturally protruded, is shorter than the basal segment.

10. *marginatus*, Bridg.

Thersilochus marginatus, Bridg. Trans. Ent. Soc. 1886, p. 354; Thoms. O.E. xiii. 1391, ♀.

Head almost broader than thorax, dull, finely punctate and posteriorly constricted; clypeus distinctly discreted, apically broadly rounded and mouth rufescent. Antennae filiform and somewhat elongate, with scape rufescent; flagellum with twenty-six distinctly discreted joints, of which the first is at least twice longer than broad. Thorax dull and little longer than high; lower half of mesopleurae finely rugose and the upper smooth with fine and sparse puncturation; metathorax more coarsely sculptured than mesonotum, with basal area about twice longer than broad and petiolar area discreted. Abdomen only slightly compressed, with the second segment apically and the following laterally below rufescent; basal segment slightly curved with postpetiole about twice longer than broad; second segment discally subquadrate and terebra two-thirds length of first segment. Legs testaceous with only the hind coxae nigrescent. Wings hyaline, with stigma and nervures nigrescent; radial branch extending almost to apex of wings; recurrent emitted beyond areolar nervure. Length, 4-4.5 mm. Male unknown.

Similar and allied to *T. jocator*, but with the antennae basally flavous beneath, the flagellum filiform and longer with the joints well discreted and the second oblong, the basal metanotal area oblong-quadrate, wings with the radial appendage longer and extending nearly to their apices, the stigma entirely black, areolar nervure shorter, basal segment nearly double length of terebra, the second apically margined with and remaining segments laterally red; it seems to differ from *T. tripartitus*, Brisch., in little but the terebral length, which I consider a very pertinent feature.

Schm. has recently often taken this species in Thuringia, but Thomson did not find it in Sweden and we have only the record of the three females, originally described by Bridgman, which were captured by Bignell at Bickleigh Woods in Devon on 16th September, 1884.

11. *jocator*, *Fab.*

Ichneumon jocator, Fab. E.S. 1793, p. 175. *Ophion jocator*, Fab. E.S. Suppl. 1798, 238; Piez. 139; Blanchard, Nat. Hist. Ins. iii. 326. *Porizon jocator*, Gr. I.E. iii. 769, cf. *lib. cit.* i. Suppl. 721, ♂ ♀. *Thersilochus jocator*, Holmgr. Sv. Ak. Handl. 1858, p. 136; Thoms. O.E. xiii. 1390, ♂ ♀; Szépl. Term. Füz. 1899, p. 230, ♀.

Head almost broader than thorax, dull and distinctly constricted behind eyes, with face broad and white-pubescent, cheeks short and clypeus apically rounded; palpi, mandibles and clypeal apex rufescent. Antennae somewhat short and stout, black or basally rufescent; flagellum of ♀ 24-jointed, with the first joint distinctly longer than the subtransverse second, and the penultimate transverse. Thorax short and coarctate, with its sides and pronotum densely white-pubescent; mesonotum dull with notauli hardly indicated; sternali distinct and acetabulae bilobed; basal metanotal area distinct and quadrate, petiolar area elongate. Abdomen with second segment apically rufescent and the following laterally, sometimes also apically, rufescent; of ♀ slightly and of ♂ strongly compressed; basal segment longer than thorax, second of ♀ subtransverse; terebra about length of first segment. Legs testaceous, with the anterior coxae basally and hind ones mainly nigrescent; hind femora usually infusate. Wings hyaline with stigma broad and piceous, apically pale and tegulae flavidous; radius emitted beyond centre of stigma, with its apical abscissa straight and double length of basal; radial branch elongate but not reaching apex of wing; recurrent nervure emitted beyond the areolar; nervellus vertical. Length, 3–3.5 mm.

First described from Germany; France, etc.; distributed over a great part of Europe (Blanchard) and said by Grav. to have been reared by Nees from fungi in which larvae of *Tinea* (*Phycis*) *arcella* were living. There are eight specimens in Bridgman's Norwich collection and he considered it common in Norfolk; Bignell found it at Plym Bridge in Devon on 21st September. A spring species, of which the male seems much the commoner sex for, though I possess examples from Govilon in Monmouth, Botusfleming, Bishops Teignton, Nunton (Marshall), Greenings in Surrey (Saunders) and Shere (Capron), I have only found the female on one occasion in Assington Thicks on hazel. The male is by no means rare, by sweeping *Chaerophyllum* flowers, reeds, bracken and grass from 13th May to 24th July, in Suffolk at Bawdsey, Bentley, Harleston, Reydon and Foxhall; elsewhere I have taken it at Diss and Winterton in Norfolk, Gosfield in Essex, Salisbury and Setley in the New Forest.

12. *carinatus*, *Bridg.*

Thersilochus carinatus, Bridg. Trans. Ent. Soc. 1889, p. 430, ♀.

Head somewhat dull and transverse, posteriorly constricted. Antennae about two-thirds of the length of body, with twenty-eight joints; three basal flagellar joints of equal length, not distinctly discreted and about half as long again as broad. Thorax somewhat dull; metanotum with a single distinct central longitudinal carina. Abdomen red, discally hardly infusate; basal segment entirely black, slightly curved, and almost straight with the postpetiole gradually and but little explanate apically;

remaining segments subcompressed, with the second longer than broad and terebra nearly half length of abdomen. Legs red with the coxae black and trochanters subpiceous. Wings with the stigma and tegulae piceous. Length, 4 mm. ♀ only.

It is said to be somewhat like *T. jocator*, though with the metanotum centrally unicarinate, and perhaps it is, consequently, referable to the subgenus *Aneuctis*, Först.

This hitherto unique female was captured by its author at Lakenham near Norwich during July, 1880, and is doubtless in his collection in the Norwich Castle Museum. I captured several females at Brandon in Suffolk on 21st May, 1911, while collecting with Col. Nurse; and possess another from Shere in Surrey.

13. Orchesia, n.n.

Porizon moderator, Ratz. Ichn. d. Forst. ii. 87, ♂ ♀ (nec Grav.).

A somewhat large and stout black species. Head very dull, a little broader than thorax, not posteriorly constricted with vertex somewhat



broad; frons subconvex, temples dull and closely punctate throughout, cheeks distinct but not broad; palpi, mandibles and clypeus rufescent. Antennae not very slender, extending very nearly to metathoracic apex; scape entirely testaceous or subpiceous; flagellum of ♀ 19- and of ♂ 20-jointed, with second joint a little longer than broad and very little longer than first, third but slightly longer than broad. Thorax stout, little longer than high; mesonotum densely shagreened-punctate and not

shining; sternauli elongate and deeply impressed, notauli apically subindicated; metathorax finely scabrous and not very dull; basal area variable, subquadrate or twice longer than broad, always distinct; petiolar area entire, not discreted, and extending beyond centre. Abdomen normally compressed and discally black with second segment sometimes obsoletely badius, the following segments laterally subrufescent below; basal segment glabrous and nitidulous, discally sulcate to beyond its centre with no aciculation, of ♂ linear and of ♀ with postpetiole apically subexplanate; second segment with distinct though small thyriddii, of ♀ a little and of ♂ strongly longer than broad; terebra as long as abdomen and not very slender. Legs testaceous with only coxae black; of normal length and not very stout; hind trochanters subflavids. Wings hyaline with stigma large and entirely nigrescent-piceous, tegulae testaceous; radius apically straight; recurrent nervure sometimes exactly continuous with, or emitted distinctly beyond, the areolar. Length, 4-4.75 mm.

I do not consider anyone has correctly recognized Ratzeburg's species; he gives the antennae with sufficient accuracy as 22-23-jointed; Holmgrén's ♀ with twenty-three joints in the flagellum must be distinct. It differs from *P. moderator*, var. 4, Grav., in the pedal colouration, from *P. caudatus*, Holmgr., in the paucity of flagellar joints and, *see* Thoms., also in the strong sternauli.

Ratzeburg tells us that Tischbein bred both sexes of this species from the heteromerous beetle, *Orchesia micans* (*cf.* Grav. I.E. i. 721), which appears to suffer from many Braconidous enemies. Possibly the present species is hyperparasitic upon the latter. Wherever *Orchesia micans* occurs, always in *Boletus fungi* on old elm trees, about Ipswich *Meteorus obfuscatus*, Nees, is to be found; thus a fungus taken at Foxhall on October 17th, 1897, produced several ♂ ♀ of *T. Orchesiae* on 1st April, 1898 (from which the above description is drawn), while by January 12th 1901, more of both sexes, together with many of the beetle and *M. obfuscatus* had emerged. A second fungus yielded only the coleopteron and Braconid. But a third produced, besides these, ten *T. Orchesiae* in equal sexes and a female *Proctotrypes parvulus*, Hal.

14. *moderator*, Holmgr.

Ichneumon moderator, Linn. S.N. 1758, 564; *Ophion moderator*, Fab. Piez. 137; *Porizon moderator*, Gr. I.E. iii. 783, ♂ ♀; *Cynipsichneumon strobilellae*, Christ, Naturg. 1791, p. 385, pl. xlii, figg. 4 et 5 (?). *Thersilochus moderator*, Holmgr. Sv. Ak. Handl. 1858, p. 144, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 193; Thoms. O.E. xiii. 1395, ♂ ♀.

Head dull and almost broader than thorax with vertex rather broad and posteriorly hardly constricted; cheeks subelongate and subbuccate; clypeus apically rounded and subelevated, usually rufescent with the mouth infusate. Antennae hardly extending to thoracic apex; flagellum slender and filiform, of ♀ with about twenty joints, of which the first is rather longer than the second and second longer than broad; scape, especially in ♂, often rufescent beneath. Thorax coarctate, dull with notauli wanting; metathorax rugosely punctate and subelongately pubescent; basal area elongate and linear, petiolar area extending beyond centre. Scutellum apically compressed, in ♂ subacuminate; pleurae dull and finely alutaceous, with no sternauli. Abdomen subfusiform and immaculate black or centrally badius; basal segment subelongate and little

curved, discally deplanate, with postpetiole broad, neither laterally nor dorsally aciculate, but with foveae before spiracles; second segment not transverse, and terebra little shorter than abdomen. Legs slender and dull red, with coxae, trochanters and base of femora, especially of the hind ones, nigrescent; anterior tarsi mainly and hind ones apically dark. Wings hyaline with the short and not very broad stigma black, its base and apex paler, and tegulae rufescent; radial nervure not incrassate at areolar nervure, its apical abscissa straight and double length of basal, which is emitted from beyond centre of stigma, its branch subelongate, but not extending to apex of wing; recurrent nervure emitted beyond areolar, nervellus vertical. Length, 2.5–3.5 mm.

The elongate terebra of the female and antennae of the male will distinguish this from our other small black species.

Said to be usually common throughout north and central Europe, though apparently but little understood; Brischke bred it in Prussia from its own elliptic, grey cocoon with a flavous central girdle from larvae of the British weevil *Ceuthorrhynchus cyanipennis*. Other Coleopterous hosts are given by Gaulle as *C. napi* and *C. punctiger* on Goureaux's and Giraud's authority. This circumstance would seem to prove the species, as now understood, distinct from that (or those) of the older authors, for Westwood states (Mod. Class. ii. 143) "The larva of *Ophion moderator*, Fab., destroys that of *Pimpla strobilellae*, Fab.;" and in his account of The Police of Nature, C. D. Wilcke shows in 1838 that *Ichneumon strobilella*, while destroying the larvae of *Phalaena strobilella* in fir cones, is itself killed by "*Ichneumon moderator*, another very small species of ichneumon-fly" (cf. The Mirror Magazine, 1838, p. 123 et Kirby and Spence), as remarked by Linnaeus. In Britain *T. moderator* is recorded from Norwich in May and June by Bridgman, and I do not consider it very common, though on account of its small size it is doubtless overlooked. Chatham in May (Garde), Seaford (Piffard), Shere (Capron), Bexhill in May (Esam) and Greenings in May and June (W. Saunders). I have invariably met with the male by promiscuous sweeping in the first half of May, about woods and roadside hedges; but the female probably hibernates for it has occurred to me so late as the 28th and 29th September and so early as April whence it extends to June on Heracleum, reeds on the coast, thistles, young willow leaves and house-windows; it is more often beaten from trees than swept from herbage; and has been found at Leiston, Southwold, Bradley, Aspell Woods, Palmers Heath near Brandon, Bramford, Bentley and Monk Park Wood in Suffolk; and at Spring Vale in the Isle of Wight.

15. *saltator*, Fab.

Ichneumon saltator, Fab. S.I. 1781, 433. *Ophion saltator*, Fab. Piez. 137, ♀. *Polizon saltator*, Grav. I.E. iii. 777; Zett. I.L. i. 397. *Thersilochus saltator*, Holmgr. Sv. Ak. Handl. 1858, p. 140, ♂ ♀; Thoms. O.E. xiii. 1397, ♀.

Head almost broader than thorax, little constricted posteriorly; temples somewhat shining, cheeks subbuccate and subelongate; clypeus distinctly discreted, rufescent and apically rounded, with palpi and mandibles concolorous. Antennae apically slightly attenuate and basally testaceous; flagellum with many and distinct joints, the first longer than the second, which is not transverse. Thorax coarctate with notauli

wanting; basal area elongate-quadrate, petiolar area extending beyond centre; pleurae finely and alutaceously rugose, not punctate; sternauli wanting. Abdomen short fusiform, little compressed, immaculate black; basal segment little curved, discally subdeplanate, with postpetiole apically explanate; second segment transverse; terebra stout, shorter than first segment and apically strongly reflexed. Legs somewhat stout and testaceous with coxae black; hind femora and sometimes anterior subinfusate. Wings hyaline with stigma large and piceous, tegulae flavidous; apical abscissa of radius straight and at least double length of basal, which is emitted from centre of stigma, with its branch not extending to apex of wing; recurrent nervure emitted beyond the areolar, nervellus vertical. Length, 3 mm.

Originally described from English material in the Banks Collection. Belgium in May and September, Lapland, Sweden, etc.; bred by Perris from *Tischeria angusticolella* in France. Fitch records two males bred from galls of *Cynips Kollari* (Entom. 1880, p. 257); and Bignell raised it on 6th April from *Micropteryx unimaculella* in Devonshire. This species, as I understand it, is the most fragile though not the smallest of the genus in Britain, always with an immature appearance; it is very similar to *T. morionellus*, though at once known, superficially by its clear testaceous legs and antennal base, particularly by the 20-jointed female and 22-jointed male flagellum, which in the latter is subelongate. In my experience it occurs only from 17th August to 14th September; I possess two batches, each comprising both sexes: one was captured by Beaumont at Harting in Sussex in 1899 and the other was swept from reeds in salt marshes at Southwold on the Suffolk coast in September, 1907 and 1910, when it occurred in considerable numbers; together with a solitary female at light on the pier there in 1912. Three males swept from sallow in Wicken Fen, Cambs., during June, 1902, appear to belong to this species.

TRIBE

CREMASTIDES.

CREMASTUS, *Gravenhorst*.

Gr. I.E. iii. 1829, 730.

Head with the vertex narrow and its orbits usually pale-marked, with somewhat large ocelli; genal costa straight; mandibles apically a little constricted with the teeth subequal, basally not reaching the oblong eyes, which are internally subparallel; clypeus apically more or less rounded and basally always discreted; palpi short, the maxillary with the three apical joints of decreasing length. Antennal scrobes ovate-globose, a little excised; flagellum nearly always very slender. Thorax cylindrical, with pronotal epomiae distinct; notauli obsolete or very rarely apically deep; mesosternum not transverse, its central sulcus fine and sternaui obsolete or wanting; metathoracic areae neatly determined, with the areolar elongate and emitting costulae before its centre, sometimes apically incomplete; costellae entire, spiracles small and circular; and the apex somewhat produced beyond the coxal insertion. Scutellum a little convex, unusually margined to its apex on either side. Abdomen strongly compressed; basal segment with spiracles far beyond its centre, the postpetiole not laterally acute with epipleurae of the discally aciculate second segment inflexed; the sixth and seventh apically emarginate or excised; terebra slender, with spicula apically deflexed. Legs slender, with the mutic hind femora short; posterior tibiae with unequal calcaria; onychii narrow, with claws slender and short. Wings with the stigma large, broad and conspicuous; areolet always wanting, with the submarginal nervure strongly elongate and often as long as the basal abscissa of the radius; the vertical upper basal nervure rarely postfurcal; lower angle of discoidal cell right or obtuse; lower wings with cubital nervure basally obsolete.

An interesting genus of broad distribution, from which *Tarytia*, Cam., of even wider range, is perhaps hardly distinct. Our species have become considerably involved, considering the little work that has hitherto been done upon them; Thomson has constituted this genus the subject for one of his admirable monographs in *Opusc. Ent.* and sums up what others, but especially himself, have done in his "Cremastus och närstaende genera" of 1890. Szépligeti and Schmiedeknecht seem to have advanced the subject but little since that time, though a good many new species have been published "and we have almost certainly now more than exist in Nature," as the latter remarks of the palaearctic region. The British list, however, is by no means crowded in this respect, though all my own specimens fall into those species already reported hence and I have at present no reason to suppose there are others. An undetermined one is reported (*Entom.* 1880, p. 68) to have been bred from *Coleophora solitariella* by Champion.

Three or four other palaearctic genera have been recognised in this Tribe, of which only the typical one has hitherto occurred, or is at all likely to occur, in Britain.

Table of Species.

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|-------|-----|---|-----------------------|
| (4). | 1. | Clypeus apically subtruncate and callose; anterior tibiae subconstricted. | |
| (3). | 2. | Submarginal as long as basal radial nerve; stigma broad | 1. GEMINUS, Grav. |
| (2). | 3. | Submarginal shorter than basal radial; stigma narrow | 2. BELLICOSUS, Grav. |
| (1). | 4. | Clypeus apically rounded; anterior tibiae not at all constricted. | |
| (8). | 5. | Lateral petiolar sulci entire; thorax not pale-lined. | |
| (7). | 6. | Clypeus not apically elevated; hind tibiae mainly white | 3. SPECTATOR, Grav. |
| (6). | 7. | Clypeus apically elevated; hind tibiae not white-marked | 4. PUNGENS, Grav. |
| (5). | 8. | Lateral petiolar sulci short; thorax usually pale-lined. | |
| (12). | 9. | Scutellum flavous; metathorax not apically produced. | |
| (11). | 10. | Petiolar area transcostulate; cheeks not short | 5. DECORATUS, Grav. |
| (10). | 11. | Petiolar area very finely shagreened; cheeks very short | 6. INTERRUPTOR, Grav. |
| (9). | 12. | Scutellum black; metathorax apically produced over coxae | 7. INFIRMUS, Grav. |

1. geminus, Grav.

Cremastus geminus, Gr. I.E. iii. 744, ♀; Thoms. O.E. xiv. 1454, ♂ ♀.

Head constricted behind the eyes; clypeus twice broader than long, apically truncate and subcallose; labrum exserted; mouth, a genal mark and nearly the entire orbits, flavidous. Antennae extending beyond thoracic apex, with flagellum apically subattenuate and its basal joints rufescent beneath. Thorax black, with no distinct notauli; areola entire, circumcarinate; petiolar area not trans-strigose. Scutellum black. Abdomen with the second segment aciculate throughout and, in ♀ only, red with its base and a lateral spot black; first segment apically rufescent in both sexes; terebra about half length of abdomen. Legs red, with the anterior tibiae apically constricted; hind coxae, trochanters, tarsi, with both extremities of their tibiae and base of intermediate coxae, piceous or nigrescent. Wings with the piceous stigma somewhat broad, and tegulae stramineous; submarginal nerve elongate and not shorter than basal abscissa of radius. Length, 8–9 mm.

This species and the next one are distinguished from our others by both Thomson and Schm. by the subtruncate clypeus, the latter adds that it is twice broader than long, the former that it is subcallose and the anterior tibiae apically constricted. The breadth of the stigma and colouration of the second segment will divide these two kinds, which were synonymised by Marshall in 1872.

This species appears anything but common on the Continent and to be little known, though recorded from Germany (Grav.), France (Gaulle), Austria (Kirchner) and Sweden (Thomson). In Britain it is an abundant parasite of *Psyche villosella*, Och., from which Bankes bred three males

on July 19th, 1900, at Bournemouth in Hants and several of both sexes between 26th June and 8th July, 1905, from cases collected at the same locality on third of the former month; two more females emerged from three cases of the same host, which contained nothing but the host's larval skin and this parasite's cylindrical black cocoon with a white central cincture, taken by Mrs. Cowl in Dorset, on 19th July, 1899—the remaining cocoon contained on 14th March following a dead *Psyche* larva and a dead parasitic larva, which failed to attain maturity; I also possess half-a-dozen examples bred by Barrett from British specimens of this host. Beaumont took a long series at Kilmore in Ireland between 13th and 27th August, 1898; but it is certainly rarely seen on the wing, since Miss Chawner found but a single female in the New Forest and one male occurred to me on 24th August, 1905, in the marshes at Brandon in Suffolk. Rev. T. A. Marshall has recorded (E.M.M. 1866, iii. p. 92) his capture of many specimens of this "rare" species at Freshwater Bay in Pembrokeshire.

2. *bellicosus*, Grav.

Cremastus bellicosus, Gr. I.E. iii. 741; Holmgr. Sv. Ak. Handl. 1858, p. 110; Brisch. Schr. Nat. Ges. Danz. 1880, p. 178; Thoms. O.E. xiv. 1454, ♂ ♀.

This species agrees with the last in having the clypeus twice broader than long and its apex both callose and subtruncate, with the anterior tibiae apically constricted. But it is a little smaller and stouter, with the second segment of ♀ only apically castaneous, the stigma is distinctly narrower, the submarginal nervure shorter and the radial emitted further beyond the centre of the stigma.

In both sexes the orbits are rufescent flavous, the mandibles except their teeth and as a rule the clypeus are flavous; the front coxae and trochanters are more or less broadly piceous, the hind femora are not always piceous nor their tibiae basally infusate. The stigma of the hyaline wings is piceous and their tegulae flavidous. Length, 8 mm.

Germany (Grav.), France (Gaulle) bred from a caterpillar on *Camomilla* (Giraud), Belgium in August (Fosquinet), Austria (Kirchner) and Sweden (Thomson). Fitch records this species as reared by M'Rae from *Psyche villosella* (Entom. 1881, p. 140); but it was at that time considered synonymous with the last and certainly needs further confirmation as British, since the only example I possess is a female, bred by Dr. Chapman, with *Ischnus tineidarum*, Gir. and *Limnerii*, during 1905 from *Pumea casta* at Lugano.

3. *spectator*, Grav.

Cremastus spectator, Gr. I.E. iii. 740, ♀; Blanch. Hist. Nat. Ins. iii. 326; Holmgr. Sv. Ak. Handl. 1858, p. 109; Thoms. O.E. xiv. 1452, ♂ ♀. (?) *C. linearis*, Gr. l.c. 739 et *C. binotatus*, Gr. l.c. 740, ♂ ♂.

Head strongly constricted behind eyes, and triangular from in front; cheeks elongate; clypeal apex semicircular and not at all elevated; labrum concealed; palpi, mandibles and all the orbits flavous, ♂ clypeus mainly concolorous; face griseous-pilose. Thorax black, of ♂ sometimes with circular or hamate pale humeral marks; areolar entirely and strongly circumcarinate with strong costulae; petiolar area elongate and

strongly trans-strigose. Scutellum black. Abdomen with lateral petiolar sulci entire and a little curved; the strongly elongate second segment narrowly rufescent apically in ♀, apices of second and third segments more broadly red in ♂; terebra but slightly shorter than abdomen. Legs red with coxae and trochanters black, the anterior apically flavous; hind tibiae and tarsi piceous with the former except at both extremities externally pure white; ♂ with anterior tibiae flavous and the hind femora sometimes infusate. Wings with the stigma piceous, basally pale and not broad; tegulae pale stramineous; radius subsinuate and emitted far beyond centre of stigma. Length, 8–10 mm.

This and the next species are distinct from the remainder of the genus in the entire and subcurved lateral petiolar sulci; not broad stigma, emitting radius far beyond its centre; in the entire areola and trans-rugose petiolar area, the long pale cheeks and anteriorly triangular head. The snow-white outer side of its hind tibiae renders the present a conspicuous species.

Piedmont, France, Germany, Sweden, Belgium in June, and Austria. It was given by Westwood in 1840 as type of the genus, and he knew but three British species; it must be very rare with us, since the only record is by Bignell, who captured it at Bolt Head in south Devon, during the middle of June. Two females were taken on Clare Island, Co. Mayo, in September, 1910, by Rev. W. F. Johnson (recorded by me under the name *C. albipennis*, Zett., in Proc. R. Irish Acad. 1911, No. 24, p. 15). The only other specimens I have seen are a female, of the form described by Thomson with short terebra, which was in a rabbit's hole on the open heath on 11th June, 1908, near Brandon in Suffolk, and a male swept a mile or so away at Lakenheath just nine years earlier. I have also examined a beautiful male captured during September, 1910, at Kings Lynn by Atmore.

4. *pungens*, Grav.

Cremastus pungens, Gr. I.E. iii. 745, ♂ ♀; Thoms. O.E. xiv. 1453. ♀. (?) *Porizon albipennis*, Zett. I.L. 396, ♂; *Cremastus albipennis*, Holmgr. Sv. Ak. Handl. 1858, p. 109, ♂ ♀.

Head with the clypeus apically a little elevated; orbits, mandibles except apically, and sometimes the clypeus, rufescent. Thorax immaculate black, with the areola circumcarinate. Abdomen with lateral petiolar sulci entire; segments two and three apically rufescent; terebra longer than half abdomen. Legs red with anterior tibiae not apically constricted; all the coxae and trochanters, except sometimes front ones, mainly black; hind legs subinfusate. Wings with stigma piceous and tegulae pale flavous. Length, 8–9 mm.

This species was easily distinguished from the last by Thomson by the subelevated clypeal apex and longer terebra, but Gravenhorst terms that of the former species only *abdomine paulo brevior* and of the latter sometimes *dimidio abdomine longior*. Schm. thinks the hind pedal colour their only difference.

It is probable that it was Holmgren's and not Gravenhorst's species that Marshall regarded as British, since the latter is given by him as no more than a doubtful synonym, and it was not known to Desvignes in 1856.

Several of both sexes in Germany (Gravenhorst); Austria (Kirchner) and France (Gaulle). *C. albipennis*, Holmgr., was recorded with some hesitation from *Coccyx strobilorum** by Fitch (Entom. 1883, p. 67); but that we have any claim upon *C. pungens* is very doubtful, since Schm. considers it to occur only in central Europe and no one seems to quite know what Holmgren's species is nowadays.

5. *decoratus*, Grav.

Cremastus decoratus, Gr. I.E. iii. 734; Brisch. Schr. Nat. Ges. Danz. 1880, p. 178; Thoms. O.E. xiv. 1452, ♂ ♀ (nec Holmgr.).

Head constricted behind the eyes, of ♂ flavous with the ocellar region to scrobes alone black, of ♀ black with the mouth and orbits flavous and face partly rufescent; clypeus apically rounded and cheeks not short. Thorax short and stout, scarcely longer than high; with the pleurae finely punctate; in ♀ the prothorax and except three red or nigrescent discal vittae mesonotum flavous, in ♂ with metathorax also flavous-marked; notauli wanting; areola punctate and not obsolete apically; petiolar area impressed and trans-costulate. Scutellum flavous. Abdomen slightly longer than head and thorax, black with segmental apices red or in ♂ often flavous; petiole smooth with its lateral sulci indistinct; postpetiole longer than broad and half length of petiole; terebra a little longer than half abdomen. Legs fulvidous, with the coxae and trochanters flavous and the hind ones basally black; hind tarsi, with both extremities of their tibiae piceous, and their femora usually black-marked externally. Wings hyaline; stigma piceous, tegulae flavidous, and the discoidal cell as long as the brachial only. Length, 9–10 mm.

Distinctly larger and stouter than the next species, with which it might be confused on account of the profuse pale colouration; instantly known from all our other kinds by the strongly and evenly trans-striate petiolar area.

Three specimens from southern Europe (Gravenhorst), Sweden and Germany (Thomson), bred by Brischke from larvae of *Nothris verbascella* (Zeits. Ges. Nat. 1880, p. 178), France (Gaulle) bred from *Evetria buoliana* and by Giraud in 1877 from *Grapholitha servillana*. It was introduced as British by Bridgman (Trans. Ent. Soc. 1889, p. 430) on the strength of specimens bred in August, 1887, by Fletcher from *Depressaria badiella* at

* CAMPOPLEX FLAVIVENTRIS, Ratz.

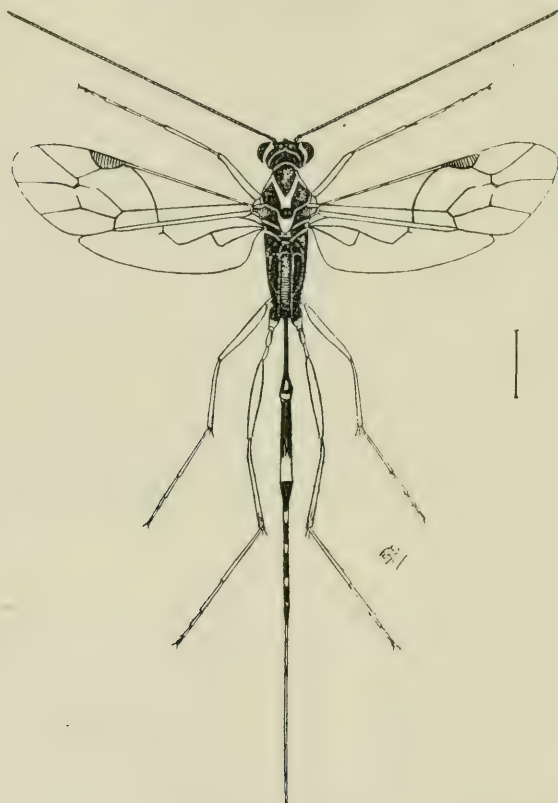
Ichn. d. Forst. i. 98; ii. 84, ♀. *Limneria flaviventris*, Bridg.-Fitch. Entom. 1885, p. 105, ♀.

"In place of the areolet, only a simple nervure (*Porizon*?). *Campoplex flaviventris*; 2½ lines long. ♀. A species in many respects remarkable: (1) the metathoracic areae entirely smooth and the costae indistinct in places; (2) only a simple nervure in place of the areolet; (3) the stigma is not linear-lanceolate, but triangular and rather large; (4) no external sign of the terebra; (5) abdomen laterally compressed from apex of first segment and the ventral surface ochre-yellow, such as Gravenhorst does not mention in any section. Otherwise the colour agrees with *C. armillatus*; only that the hind femora, tibiae and tarsi are dark brown, with the ring on the hind tibiae less distinct. One bred by Hr. Saxcen from *Tortrix Strobilana* and I obtained another from fir cones full of *T. Strobilana*. This species must be common in Harz." (Ratz. *supra*.) "Aroclit wanting, *Campoplex flaviventris*. Metathoracic areae not entirely smooth but distinctly though very finely and densely rugose-punctate. This species is certainly rare: H. Heier has again bred it from *Tortrix Strobilana*; this specimen is a ♀ with the terebra exerted ¾ of the length of the body: it must have been broken off in the former specimen" (Ratz. *infra*).

This insect is unknown on the Continent nowadays, as it was to Bridg.-Fitch; it was supposed to be British and to exist in the National Collection by Desvignes (Cat. 1856. 99).

As a good species, the above rambling account of this "name" is not worth retaining in our Fauna, especially upon Desvignes' authority. Little doubt, nevertheless, can I think be entertained, especially because of the broad stigma and dark legs, that it was merely a form of *Cremastus pungens*.

Shoreham in Sussex. It is certainly rare with us and has probably been mixed with the next species, from which the trans-strigose metathorax distinguishes it, though I am not satisfied that the comparative length of the discoidal and brachial cells is constant, for my Felixstowe male has them by no means equal, while in Banks' male the basal nervure is exactly continuous, with the notauli equally obsolete and stigma dark in both. I possess a single Suffolk pair, found on flowers of *Angelica sylvestris* at Claydon Bridge during the afternoon of 12th August, 1899, and



on those of another umbellifer (*Silene flavescentis*) on the coast cliffs at Felixstowe on 20th of the following August. Banks has given me a male, along with the two female *Pimpla ruficollis*—cf. Brit. Ichn. iii. 59—from *Retinia buolianus** on 23rd July, 1903, at Corfe Castle in Dorset. Monk Soham in August, 1909.

* *CREMASTUS BUOLIANUS*, Curt.

Trans. Ent. Soc. 1854, p. 60, ♂ ♀

We need no longer, I think, regard this species as distinct from *C. decoratus*, Grav., since I find no pertinent points of difference and they have now been bred from the same host. The description is thus:—A black species; head with the orbits more narrowly in ♀, clypeus and mandibles except their apices flavous, and palpi picous; antennae subelongate, with apices of the basal joints pale beneath; thorax black with humeral lines flavous; scutellum flavous, of ♂ sometimes with a spot

6. interruptor, Grav.

Cremastus interruptor, Gr. I.E. iii. 736; Holmgr. Sv. Ak. Handl. 1858, p. 107; Thoms. O.E. xiv. 1450, ♂ ♀. Var. *C. confluent*, Gr. I.E. iii. 735, ♀; *C. ophthalmicus*, Holmgr. l.c. 108, ♂.

Head constricted behind the narrow vertex; eyes and ocelli large, cheeks very short; clypeus apically semicircular; palpi, mandibles, clypeus and orbits, as well as the ♂ face except longitudinally in its centre, flavous. Antennae hardly reaching beyond apex of thorax, with scape flavoidous beneath. Thorax short and hardly longer than high, with flavous humeral marks which are usually elongated down the mesonotal disc, often with concolorous callosities below radices, above intermediate coxae and sometimes on metapleuræ; areola apically incomplete; petiolar area trans-strigose. Scutellum flavous and not laterally margined. Abdomen with the three, four or five basal segments apically rufescent; petiole deplanate, with its lateral sulci distinct only towards the apex; second segment closely aciculate, with the three following diffusely punctate and somewhat dull; terebra a little longer than half abdomen. Legs stouter than in the allied species, red with the coxae flavoidous and basally black; trochanters, except black base of hind ones, flavous; hind tarsi nigrescent, with base and apices of their tibiae piceous. Wings hyaline, with the piceous stigma not broad and tegulae flavous; radial cell subelongate with the basal abscissa of its nervure double length of the short submarginal. Length, 9 mm.

A single German pair (Grav.), very rare in the middle of July in Sweden (Holmgr.), bred from *Tortrix buoliana* by Hartig (Jahresb. p. 208) and by Bernuth, as well as from *Tinea favillaticella* (*Gelechia dodecella*) by Reissig (Ichn. d. Forst. iii. 90), Denmark (Thoms.), Austria (Kirch.) and Belgium during July and August (Tosquinet). It has also been bred on the Continent by Brischke from larvae of a *Hyponomeuta*—specified as *H. evonymellus* by Gaulle—and in France from *Nothris verbascella* (Giraud, Ann. Soc. Fr. 1877, p. 403). In Britain it is recorded from Yarmouth in Norfolk and bred from *Cochylis zephyrana* and *Eupacilia atricapitana* (Bridgman); captured at Plym Bridge in Devon about the middle of July (Bignell); bred from—? *Tortrix* in—*Cynips Kollari* galls (Entom. 1880, p. 256). I possess but a single pair, bred from *Galanthia* or *Bulalis variella*, Steph., between 15th and 21st June, 1896, by E. R. Bankes, in the Isle of Purbeck in Dorset.

and of ♀ mainly black. Abdomen compressed and black, with petiole elongate and postpetiole clavate; ♂ with the second to fourth segments more or less broadly ferrugineous-margined; venter pale stramineous, black-banded towards its apex; terebra two-thirds as long as body. Legs flavous, with the anterior ochraceous; hind coxae and trochanters black, apically flavoidous; their femora ferrugineous or in ♀ black, with apices of the tibiae flavoidous, the latter at both extremities and apices of their tarsi piceous. Wings entirely hyaline, with nervures and stigma infuscate. Length, ♂ 3½, ♀ 4½ lines.

Curtis says of it "with the moths (*Orthotaenia* (*Retinia*) *Buoliana*) I reared two parasites, one is a *Figites* and the other is a fine species of the family Ichneumonidae. It is allied to Gravenhorst's *Cremastus confluent*"—left in the present genus by Thomson and bred from *Retinia Buoliana* by Giraud—"but as it does not agree with any of his species I shall describe it." Three males, and as many females, hatched during the fourth week of July, after the moths had ceased to appear.

7. *infirmus*, Grav.

Cremastus infirmus, Gr. I.E. iii. 746; Holmgr. Sv. Ak. Handl. 1854, p. 22; *lib. cit.* 1858, p. 110; Brisch. Schr. Nat. Ges. Danz. 1880, p. 178; Thoms. O.E. xiv. 1452, ♂ ♀.

A small, elongate and slender species. Head strongly constricted behind the eyes; vertex short, clypeus as long as broad, apically rounded and, like the elongate cheeks, mouth and orbits, flavous. Antennae extending beyond thoracic apex. Thorax immaculate black, finely and alutaceously punctate, dull; pleurae finely and closely punctate; meta-thorax rugosely punctate and apically a little produced, with the ♀ areola apically incomplete. Scutellum black. Abdomen strongly elongate and black, or with the second segment or in ♂ second and third apically rufescent; terebra as long as abdomen. Legs fulvidous with hind coxae and trochanters mainly nigrescent, as also for the most part are the hind tibiae, and sometimes the ♀ femora. Wings subhyaline, with stigma piceous and tegulae pale flavous; basal abscissa of radius but little longer than submarginal nervure. Length, 7-8 mm.

In size and outline this species strongly resembles *Nemeritis cremastoides*, but is at once known therefrom by its aciculate second segment, the pale orbits and relative length of the submarginal nervure with the basal radius.

Gottingen (Grav.), not uncommon in Sweden in July and August (Holmgr.), Austria (Kirch.), Prussia (Brischke), France and bred from *Sterrhopteryx hirsutella* (Gaulle) and from *Psyche calvella* by Fallou (Giraud, Ann. Soc. Fr. 1877, p. 403), Belgium in July and August (Tosquinet). It has been captured with us at Bolt Head in Devon on 28th June (Bignell) and bred "from two-year-old acorns containing *Carpocapsa splendana*" (Entom. 1881, p. 140). It must be anything but common on the wing, however, for I have seen but few specimens and no males; females have been most kindly given me from Guildford in Surrey on 22nd August, 1900 (E. A. Butler), Shere in the same vicinity (Capron), Ely found on 23rd July, 1903 (Cross) and Heacham in Norfolk on 27th July, 1903 (E. A. Elliott).

TRIBE

CAMPOPLEGIDES.

In temperate climates this Tribe is extremely abundant both in species and individuals, extending from Lapland to the Mediterranean coasts, but further south it seems to become decidedly scarcer and I know of few or none below the equator; this may be due, to a certain extent, to the superficial collecting that small Hymenoptera in general have at present met with in tropical countries, where the larger and more conspicuous attract especial attention to themselves; at least they go down to the Tropic of Cancer, for I have described a good many from Bengal.

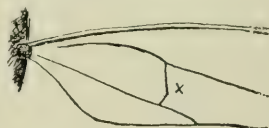
With us, and throughout both the Palaearctic and Nearctic regions in general, these insects are so numerous as to become perfectly bewildering, and so poorly are the species evolved in structure or constant in colour that their differentiation is fraught with peculiar difficulty. Even the Tribal characters are best explained by negative features: The colour is never testaceous, the external radial abscissa is not basally continuous with the submarginal nervure as in the Paniscides, nor is the areolet (though not infrequently wanting) ever obliquely quadrate as in the Mesochorides; the metathorax is not apically produced as in the Anomalides, nor the second recurrent emitted from the cubital beyond the submarginal as in the Ophionides; it bears no femoral tooth as in the Pristomerides and the narrow stigma will distinguish it from the Ophionid tribes already described.


The possibility of reducing the vast mass of Palaearctic and large number of British species to something approaching a natural classification is owed, after Holmgren, to Prof. G. C. Thomson of Lund, who in his great *Opuscula Entomologia*, fasc. xi, gives us a capital though all too brief conspectus of them in 1887. Both Holmgren and Förster had already devoted especial monographs to the larger and more conspicuous species of Gravenhorst's comprehensive genus *Campoplex*, leaving the smaller and more obscure kinds, with but few exceptions, massed in an unwieldy genus, *Limneria*, of which more than a hundred distinct species were known in Britain alone in 1885. I have followed Thomson somewhat closely in the following account of these and have adopted his genera throughout, for those sketched by Förster in 1868 were both typeless and insufficiently diagnosed, often moreover established upon the most trivial and inconstant characters (*e.g.* the presence or absence of the metanotal costulae, which I find extremely variable in their development, even in a single batch of individuals of the same brood and I have, consequently, avoided its use whenever feasible). Recent writers have been too prone to adopt these ill-bred genera, and to place far too much reliance upon the development of the external nervure of the areolet.

In the following Table of Genera especial care is necessary in regard to the depth of the metathoracic concavity; and the position of the nervellus (as in the Orthocentrides, *cf.* *Ichn. Brit.* iv. p. 54, with which the present groups also agree) is now recognised as of beautifully constant construction.

Table of Genera.

- | | | |
|-------|--|---------------------------|
| (4). | 1. Metathoracic spiracles linear or elongate, never circular. | |
| (3). | 2. Areolet of wing wanting; postpetiole always red | CHAROPS, <i>Holmgr.</i> |
| (2). | 3. Areolet of wing entire; postpetiole immaculate black | CAMPOPLEX, <i>Grav.</i> |
| (1). | 4. Metathoracic spiracles circular, very rarely suboval. | |
| (6). | 5. Clypeus with a distinct apical central tooth | SAGARITIS, <i>Holmgr.</i> |
| (5). | 6. Clypeus with no central apical tooth. | |
| (8). | 7. Eyes pilose and in ♀ internally convergent apically | CYMODUSA, <i>Holmgr.</i> |
| (7). | 8. Eyes glabrous and usually internally subparallel. | |
| (10). | 9. Abdomen apically explanate; eyes internally emarginate | CASINARIA, <i>Holmgr.</i> |
| (9). | 10. Abdomen normal; eyes not or hardly internally emarginate. | |
| (12). | 11. Petiolar area distinctly excavate; nervellus not oblique | LIMNERIUM, <i>Ashm.</i> |
| (11). | 12. Petiolar area not excavate, or nervellus oblique. | |
| (14). | 13. Head subcubical with the vertex very broad | PYRACMON, <i>Holmgr.</i> |
| (13). | 14. Head distinctly transverse, or nervellus oblique. | |
| (38). | 15. Nervellus oblique and antefurcal, usually geniculate, strong and dark. (<i>See fig.</i>) | |
| (19). | 16. Lateral foveae of clypeus large and deeply impressed. | |
| (18). | 17. Petiole deplanate and discreted; basal nervure vertical | CANIDIELLA, <i>Ashm.</i> |
| (17). | 18. Petiole elongate, slender; recurrent nervures approximate | NEPIESTA, <i>Thoms.</i> |
| (16). | 19. Lateral foveae of clypeus small or of normal size. | |
| (21). | 20. Metathorax declived throughout, its apex strongly produced | NEMERITIS, <i>Holmgr.</i> |
| (20). | 21. Metathorax usually declived from centre, hardly produced. | |
| (25). | 22. Lower basal nervure very strongly oblique, as is also nervellus. | |
| (24). | 23. Terebra concealed; radius centrally subrectangular | PHOBOCAMPA, <i>Thoms.</i> |
| (23). | 24. Terebra exerted; metathoracic areae entirely wanting | SPUDASTICA, <i>Thoms.</i> |
| (22). | 25. Lower basal nervure not or but very slightly oblique. | |
| (27). | 26. Apical abscissa of radial nervure hardly longer than basal | ECPHOROPSIS, <i>Ashm.</i> |
| (26). | 27. Apical abscissa of radial nervure evidently longer than basal. | |
| (33). | 28. Lateral petiolar sulci wanting; terebra not always exerted. | |



- (32). 29. Areolet small, not rhomboidal; ♀ flagellum not pale, terebra exerted.
- (31). 30. Postpetiole oval; terebra always longer than basal segment . . . OMORGA, *Thoms.*
- (30). 31. Postpetiole not broad; terebra always quite shortly exerted . . . LATHROPLEX, *Thoms.*
- (29). 32. Areolet large, rhomboidal; ♀ flagellum banded, terebra not exerted
- (28). 33. Lateral petiolar sulci distinct; terebra exerted. . . CALLIDORA, *Thoms.*
- (35). 34. Abdomen linear, segments three to seven strongly emarginate . . . GNOTYPA, *Thoms.*
- (34). 35. Abdomen centrally explanate, its segments not emarginate.
- (37). 36. Second segment not short, nor its spiracles before centre . . . NEPIERA, *Thoms.*
- (36). 37. Second segment short, its spiracles distinctly before centre . . . TRANOSEMA, *Thoms.*
- (15). 38. Nervellus vertical and strongly postfurcal, never geniculate, usually pale. (*See fig.*)
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- (40). 39. Lower mandibular tooth the longer; capital vertex quadrate . . . OLESICAMPA, *Thoms.*
- (39). 40. Mandibular teeth of equal length; head not vertically quadrate.
- (42). 41. Head subcubical; abdomen always extensively red-marked . . . MELOBORIS, *Holmgr.*
- (41). 42. Head distinctly transverse; abdomen black, rarely broadly red.
- (44). 43. Tarsal onychii explanate and onyches strongly pectinate . . . PECTINELLA, *Morl.*
- (43). 44. Tarsal onychii normal and onyches not or but finely pectinate.
- (46). 45. Body slender, usually black; terebra usually elongate . . . ANGITIA, *Holmgr.*
- (45). 46. Body stout, usually red; eyes internally emarginate; terebra always short.
- (48). 47. Head posteriorly dilated; cheeks elongate, not buccate . . . ANILASTA, *Thoms.*
- (47). 48. Head not posteriorly dilated; cheeks short and buccate . . . HOLOCREMNA, *Thoms.*

CHAROPS, *Holmgren.*

Holmgr. Sv. Ak. Handl. 1858, no. 8, p. 39; Ofv. 1858, p. 324.

Head transverse and somewhat constricted behind the internally deeply emarginate eyes; temples not buccate, nor clypeus basally discreted. Antennae slender and about half length of body. Thorax dull and closely sculptured; metathorax scarcely impressed, with no area, but with two parallel longitudinal carinae from its base to beyond centre; spiracles distinctly elongate. Scutellum deplanate and subquadrate, apically but slightly narrowed. Abdomen elongate, laterally compressed with the basal segment slightly reflexed, the postpetiole convex and laterally rounded, with the ventral membrane extending to beyond its centre;

terebra short. Legs with tibiae finely spinulose and claws pectinate. Wings with no trace of areolet and the nervellus curved.

The only Campoplegid genus with elongate metathoracic spiracles and no areolet. Only one palaearctic species is known but there are a great many in warmer parts of the world and I have described new ones from India. I consider Szépligeti has no justification for placing this species (Gen. Insect.) in the *Anomalides*; the lack of areolet is its only feature in common therewith, since its whole facies is like that of *Campoplex*, and Holmgren compares it to *C. pugillator*, differing mainly in its scutellar and venational structure.

1. *decipiens*, Grav.

Campoplex decipiens, Gr. I.E. iii. 596, ♀. *Charops decipiens*, Holmgr. Ofv. 1858, p. 324; Sv. Ak. Handl. 1858, no. 8, p. 39, ♂ ♀. *C. deficiens*, Thoms. O.E. xi. 1090, ♂ ♀.

A black and grey-pubescent species, with the abdomen centrally and anterior legs red. Head transverse and somewhat constricted posteriorly; occiput hardly emarginate; frons deplanate and rugulose; face slightly convex and pubescent; clypeus apically broadly rounded; mandibles somewhat broad and usually piceous, with the teeth of subequal length. Antennae apically gradually a little attenuate, of ♂ hardly longer than half body, of ♀ shorter; basal flagellar joint a little longer than second. Thorax stout, and strongly punctate or rugulose and dull; notauli sub-obsolete; metathorax declived throughout, with petiolar area not strongly concave and the upper areae incomplete. Scutellum deplanate, sub-quadrate, with sulciform basal fovea. Abdomen with basal segment hardly shorter than hind coxae and trochanters, the red postpetiole convex and not laterally parallel; third, fourth and sides of the second segments red; terebra straight and shortly exerted. Legs black with the anterior, except basally, red; intermediate femora sometimes mainly black; hind knees pale. Wings slightly infumate with the stigma infusate, radix stramineous and areolet wanting. Length, 10–12 mm.

It is said to be spread throughout Europe by Thomson, though it occurs but singly and almost invariably on dry and sunny places, especially limestone, in late summer according to Schm., while Holmgren, on the contrary, found it in central and southern Sweden in *paludibus graminosis*; Gravenhorst knew but one from Berlin, Gaulle mentions it from France, and Tosquinet took a single Belgian example in July. Giraud has recorded it (Ann. Soc. Fr. 1877, p. 404) from *Zygaena filipendulae* and *Botys silacealis*. Bridg.-Fitch. thought (Entom. 1885, p. 100) it a rare species; and the former repeats the statement (E.M.M. 1889, p. 185), in publishing its first indigenous rearing, which was from *Zygaena trifolii* by Fletcher, probably at Worthing in Sussex; he adds that "it makes a blackish-brown cocoon inside the well-known straw-coloured outer covering of *Zygaena* cocoons, and is closely adherent to its inner surface." Elliott has presented me with a single female, which is said to have been taken in the London district and, with considerable doubt, to have been bred from *Colias edusa*; in this example the second segment is constricted before its base on either side and the oblique nervellus is not intercepted, which features are shared by two males bred by Prof. Selwyn Image on 26th July, 1908, from cocoons of *Z. filipendulae* upon which they had been solitarily parasitic at Folkestone. I possess half-a-dozen other examples from J. A. Clark's London collection.

CAMPOPLEX, *Gravenhorst*.

Grav. I.E. iii, 1829, 453; Först. Verh. z.-b. Ges. 1868, p. 761.

Head nearly always distinctly transverse, rarely nearly cubical; eyes internally emarginate next the scrobes; clypeus laterally foveate, and not discreted from the closely punctate and subdeplanate face; mandibles broad with equal teeth. Antennae subfiliform, not longer than body and always somewhat stout; scape subentire. Thorax always coarsely sculptured discally, scabrous or rugulose; metathorax elongate and not apically produced; metanotum usually impressed longitudinally in the centre, rarely carinate with more or less obsolete areae; spiracles always elongate and often linear. Scutellum coarsely sculptured and not deplanate. Abdomen strongly compressed throughout and usually centrally red; first segment not plicate beyond centre of postpetiole; the two basal segments narrow with their spiracles beyond, very rarely in, their centre; third at least basally margined; terebra very rarely elongate. Legs slender with hind femora usually a little stouter; tarsi not explanate, and their claws always more or less closely pectinate; calcaria stout, with the front ones sinuate. Areolet large and broad, always triangular and distinct, often petiolate and never broadly sessile; stigma narrow; radial cell not broad, with the external radius usually bisinuate; lower wings with basal abscissa of radius and the recurrent nervure strong and of variable relative length; nervellus usually geniculate or intercepted below, rarely in, its centre, but sometimes simply a little curved at its lower extremity.

This genus is easily recognised by its elongate metathoracic spiracles and large triangular areolet. Its members range themselves in a somewhat natural sequence under two groups, according to the length of the ventral plica on the two basal segments and the relative length of the first recurrent nervure with that of the basal abscissa of the radius, in the hind wing; thus the larger species have the two former of subequal length with the radial abscissa very obviously longer than the recurrent nervure, while the smaller ones have the basal plica much the longer with the radial abscissa not or but slightly longer than the recurrent nervure; the abdomen is almost invariably flavous- or red-cinctured, with head, thorax and antennae immaculate black. I have had to omit from the following table three species, which appear either synonymous with some there included, or but insufficiently established as indigenous. These are *C. validicornis*, Holmgr. (Sv. Ak. Handl., 1854, p. 9, ♂ ♀), which figures in both Marshall's catalogues, but is not tabulated by Bridg.-Fitch in 1885; it was given by its author as a var. of *C. pugillator* in 1858, and is unmentioned by him in 1872. *C. insignitus*, Först., is said (Proc. S. Lond. Ent. Soc., 1896, p. 87) to have been bred from larvae of *Thecla betulae* by H. Williams; Mocsary is said by Dalla Torre to have also raised it from *Hylophila bicolorana*; it differs but slightly from *C. foreolatus*, and I suspect some error in our record. *C. pulchripes*, Holmgr., is a male which still remains unmentioned since first described in 1872; and no reliance can be placed upon the undescribed and admittedly doubtful female, thought to constitute its alternate sex by Fitch (Entom., 1880, p. 256) and bred by Weston from *Cynips Kollari* galls.

Table of Species.

- (28). 1. Basal abscissa of radius in hind wing at least half as long again as its recurrent nervure; membrane of first segment hardly longer than that of second.
- (15). 2. Postpetiole hardly broader than petiole; abdomen strongly compressed and centrally flavidous.
- (12). 3. Abdomen centrally subrufescent-flavous; oral costa not lamelliformly elevated.
- (7). 4. Frons acutely carinate; petiole with no lateral foveae.
- (6). 5. Mesopleural speculum somewhat dull; scutellum centrally shining
- (5). 6. Mesopleural speculum shining; scutellum dull and punctate
- (4). 7. Frons not acutely carinate; petiole with deep lateral foveae.
- (9). 8. Third segment laterally black-lined; abdomen less compressed
- (8). 9. Third segment laterally immaculate; abdomen strongly compressed.
- (11). 10. Hind femora black, their tibiae entirely stramineous
- (10). 11. Hind femora apically pale, their tibiae apically infusate
- (3). 12. Abdomen centrally citrinous; oral costa lamelliformly elevated apically.
- (14). 13. Head hardly constricted behind the eyes; larger
- (13). 14. Head distinctly constricted behind the eyes; smaller
- (2). 15. Postpetiole distinctly broader than petiole; abdomen less strongly compressed and centrally red or black.
- (21). 16. Basal flagellar joints distinctly discreted; cheeks usually elongate.
- (20). 17. External angle of discoidal cell rectangular; abdomen red-marked.
- (19). 18. Intermediate femora to centre, and hind tibiae basally, black
- (18). 19. Intermediate femora and base of hind tibiae red
- (17). 20. External angle of discoidal cell acute; abdomen black
- (16). 21. Basal flagellar joints continuous; cheeks usually very short.
- (25). 22. Third segment partly black; hind femora apically pale.
- (24). 23. Fourth segment partly pale
- (23). 24. Fourth segment entirely black
- (21). 25. Third segment entirely red; hind femora entirely black.
- (27). 26. Scrobal orbits tuberculate; second segment entirely red
1. CARINIFRONS, *Holmgr.*
2. RUGULOSUS, *Först.*
3. RUGIFER, *Först.*
4. FALCATOR, *Fab.*
5. OBLITERATUS, *Holmgr.*
6. OXYACANTHAE, *Boie.*
7. ANGUSTATUS, *Thoms.*
8. TEREBRATOR, *Först.*
9. NITIDULATOR, *Holmgr.*
10. MYRTILLUS, *Desv.*
11. FEMORATOR, *Bridg.*
12. CULTRATOR, *Grav.*
13. PUGILLATOR, *Linn.*

- (26). 27. Scrobal orbits simple; fourth segment black-marked 14. FOVEOLATUS, *Först.*
- (1). 28. Basal abscissa of radius in hind wing not or hardly longer than it recurrent nervure; membrane of first segment double length of second, extending to spiracles of latter.
- (30). 29. Nervellus geniculate, or intercepted, above its centre 15. XENOCAMPTUS, *Först.*
- (29). 30. Nervellus geniculate and intercepted below its centre.
- (32). 31. Scrobes auriculate; frons deeply impressed above antennae 16. ANCEPS, *Holmgr.*
- (31). 32. Scrobes simple; frons not or hardly impressed.
- (34). 33. Postpetiole red-marked; abdomen and legs broadly flavous 17. CONFUSUS, *Först.*
- (33). 34. Postpetiole not at all red; abdomen and legs red-marked.
- (40). 35. Head subcubical and not constricted behind the eyes.
- (37). 36. Recurrent nerve emitted before centre of areolet; propleurae striate 18. LAPPONICUS, *Holmgr.*
- (36). 37. Recurrent emitted beyond centre of areolet; propleurae not striate.
- (39). 38. Areolet large; metanotal impression superficial 19. BUCCULENTUS, *Holmgr.*
- (38). 39. Areolet small; metanotal impression somewhat deep 20. PUNCTATUS, *Bridg.*
- (35). 40. Head transverse and distinctly constricted posteriorly.
- (44). 41. Frons strongly carinate centrally; hind femora slender.
- (43). 42. Hind femora mainly red; frons with but one carina 21. JUVENILIS, *Först.*
- (42). 43. Hind femora black; frons with carinae radiating from scrobes 22. COSTULATUS, *Bridg.*
- (41). 44. Frons not or at most but obsoletely carinate.
- (46). 45. Basal nervure continuous; petiole straight and linear 23. LEPTOGASTER, *Holmgr.*
- (45). 46. Basal nervure not continuous; petiole not straight nor linear.
- (50). 47. Mesosternal epicnemial obsolete; hind tibiae black.
- (49). 48. Stigma nigrescent; metanotal areola wanting 24. INCOMPLETUS, *Bridg.*
- (48). 49. Stigma fulvidous; metanotal areola laterally carinate 25. ERYTHROGASTER, *Fst.*
- (47). 50. Mesosternal epicnemial distinct; hind tibiae centrally pale.
- (56). 51. Metanotum with areae; mesosternal acetabulae bilobed before middle coxae.
- (53). 52. Tegulae bright flavous; terebra elongately exerted 26. MONOZONUS, *Först.*
- (52). 53. Tegulae mainly or partly infuscate; terebra short.

- (55). 54. Radius emitted beyond centre of the normal stigma 27. OBREPTANS, *Först.*
 (54). 55. Radius emitted before centre of the rather narrow stigma 28. DISCLUSUS, *Först.*
 (51). 56. Metanotal areae obsolete; mesosternal acetabulae simple.
 (58). 57. Antennae filiform; second segment pale only at its extremity 29. ZONELLUS, *Först.*
 (57). 58. Antennae apically attenuate; second segment broadly red apically.
 (60). 59. Mesopleurae strongly punctate; genal costa not sinuate 30. SOBOLICIDA, *Först.*
 (59). 60. Mesopleurae not strongly punctate; genal costa not sinuate.
 (62). 61. Second segment little longer than third; hind femora black 31. TENUIS, *Först.*
 (61). 62. Second segment distinctly longer than third; all femora pale 32. MARIAE, *Schm.*

1. *carinifrons*, *Holmgr.*

Campoplex carinifrons, Holmgr. Sv. Ak. Handl. 1858, p. 34; Bih. Sv. Ak. Handl. 1872, p. 24; Thoms. O.E. xi. 1057, ♀. *C. minax*, Först. Verh. z.-b. Ges. 1868, p. 795, ♀.

A black and grey-pubescent species. Head transverse and a little constricted behind the eyes, with mandibles flavous; frons feebly impressed, with a distinct central longitudinal carina. Metathorax transversely striate; mesopleurae strongly punctate and nearly dull. Scutellum diffusely punctate, centrally nitidulous, and laterally margined to beyond its centre. Abdomen with the second segment apically and three following entirely dark flavous, of which the third bears a short black lateral line; petiole with no lateral foveae. Legs flavous with the front coxae and trochanters black-marked; hind legs dark flavous with coxae and trochanters and the base of femora broadly black, their tarsi ferrugineous. Wings slightly clouded with stigma fulvous, tegulae piceous, the recurrent nervure emitted from centre of areolet and nervellus intercepted a little below the centre. Length, 16–20 mm.

Found rarely in Sweden during early August and at Aix-la-Chapelle (Holmgr.); at Genck in Belgium during August (Tosq.), and in France (Gaulle). Bred from *Macaria (Semiethisa) aestimaria* by Perris (Ann. Soc. Fr. 1877, p. 403), and from *Lophyrus rufus* by Rondani (*sec* DT.). Bignell raised it in Devon from an unknown host (Entom. 1885, p. 19 *et* Tr. Devon. Assoc. 1898, p. 490). I possess a single male bred from *Phalera bucephala* by G. W. Mason at Barton-on-Humber in Lincs.

2. *rugulosus*, *Först.*

Campoplex rugulosus, Först. Verh. z.-b. Ges. 1868, p. 798; Thoms. O.E. xi. 1057, ♀.

In shape, colour and conformation very like the last species; but smaller and more compressed, with the metathorax shorter and but finely trans-striate throughout, the speculum nitidulous and subglabrous, areolet broader and emitting the recurrent nervure before its centre, the nervellus

intercepted lower, the scutellum dull and very closely punctate, legs red with all the coxae, hind trochanters and their femora black with only apices of latter usually red, the abdomen with the second segment laterally and apically, as well as the third and fourth entirely and two following laterally red, of which the third and fourth are discally black. Length, 16 mm.

A rare species and apparently noticed only in Northern Germany. The first British example was bred from *Trachea piniperda* by Norgate (Tr. Ent. Soc. 1886, p. 344). I possess a single female taken in the Hastings district of Sussex, named by Bridgman, and kindly given me by Rev. E. N. Bloomfield; and have seen another captured by Tonge, in coll. Lyle, at Tilgate Forest.

3. *rugifer*, Först.

Camplex rugifer, Först. Verh. z.-b. Ges. 1868, p. 825, ♂; Thoms. O.E. xi. 1059, ♀.

Head with the frons centrally carinate, but not impressed, above the antennae; three apical joints of maxillary palpi fulvous. Thorax with the metanotal impression not very deep; metapleural areae coarsely punctate, with the interstices alutaceous; internal dentiparal carinae somewhat distinct. Scutellum subdeplanate, coarsely and strongly punctate, a little narrowed towards its apex. Abdomen black with the third and fourth segments entirely, the second apically and laterally, rufescent flavous; fourth apically subinfusate, and the third with black lateral line to its centre; lateral petiolar foveae sulciformly prolonged to postpetiolar apex; terebra apically fulvous. Legs fulvous with coxae, trochanters, base of intermediate and whole of hind femora black; hind tibiae apically piceous. Wings with tegulae pale; areolet sessile, high and emitting the broadly fenestrate recurrent nervure nearly from its centre. Length, 11-16 mm.

The female was described from Germany, and the male from Borgholm in the Baltic Isle of Oland. It is very rare or overlooked; I have specimens of both sexes that I am unable to ascribe to any other species, though here they do not entirely coincide with the description since the frons is not "linea media elevata instructa," but somewhat indefinitely carinate. The single male was captured at Felden in Herts by the late Mr. Albert Piffard; three females were found in the New Forest by Miss Chawner; and on 13th June, 1896, I took another female in the Bentley Woods near Ipswich.

4. *falcator*, Fab.

Ichneumon falcator, Fab. S.E. 1775, 339; Jur. Nouv. Méth. 1807, 110, ♀. *I. surratus*, Schr. En. Austr. 1781, 362; Gmel. S.N. 1790, 2697. *Ophion falcator*, Fab. Piez. 136. *Camplex mixtus*, Gr. I.E. iii. 601; Holmgr. Sv. Ak. Handl. 1858, p. 33, ♂ ♀. *C. falcator*, Holmgr. Bih. Sv. Ak. Handl. 1872 p. 57; Thoms. O.E. xi. 1060, ♂ ♀.

Grey-pubescent throughout. Abdominal segments two to four rufescent-flavous, with the second discally infusate to beyond its centre. Legs rufescent flavous with the coxae, trochanters, intermediate femora basally, and the hind ones almost to their apices, black; anterior coxae and

trochanters partly flavous; intermediate femora of ♂ only partly black beneath. Wings flavescens with the tegulae and stigma rufescent. Length, 15–20 mm.

At once known by the strongly but not closely punctate mesopleurae which bear a few distinct curved striae before the speculum, the third segment with no lateral black line, the hind tibiae unicolorous flavous throughout, palpi nigrescent and tarsal claws distinctly pectinate to their apices.

Sweden (Fab.), where it is not unfrequent in shady woods (Holmgr.); Holland (Burgst.); common in Belgium (Tosq.), and France (Gaulle), and throughout north and central Europe (Thoms.). It has been bred abroad from *Phalera bucephaloides* and *Simyra nervosa* by Mocsáry, from



Cucullia argentea and *C.sp.*, by Brischke; and at home from *Pygaera bucephala* by Bridg. and Norgate (Entom. 1881, p.140), *Notodonta ziczac* on 24th April in Devon by Bignell and by De Geer, *Biston hirtaria*, *Amphydasis prodromaria*, and on 4th August from *P. bucephala* (l.c. 1883, p.65), from *Notodonta camellina* (l.c. 1884, p.67) and by Desvignes from *Anarta myrtilli*. Lastingham in Yorks (Marshall), Lands End (Marquand), Norfolk (Bridg.), common at Glanvilles Wootton in Dorset (Dale), Gamlingay in Cambs (Vict. Hist.). I possess a long series of this species, which is by no means uncommon with us; the majority are from the collection of the late J. A. Clarke, who bred it from Folkestone pupae of *Eurymene dolobraria* on 17th Aug., 1907; Hugh Main bred several from *Pygaera bucephala* at Woodford in Essex during July, 1910, and some

cocoons he sent me were evacuated on 9th of the following month; Prof. Image has given me a male, bred in 1903, "I think from larva of *A. caji*, certainly from an *Arcitia* larva"; and Goodwin a female reared from larva of *Notodonta chaonia* found in August, 1902, in Kent. On the wing it appears scarce and I have not met with it, though Charbonnier took it at Freshford near Bath in September; Capron captured one about Shere in Surrey; and Adams found it on 19th of the same month in 1900 at Lyndhurst, where it has been bred by Miss Chawner.

5. *obliteratus*, Holmgr.

Campoplex obliteratus, Holmgr. Bih. Sv. Ak. Handl. 1872, p. 59; Thoms O.E. xi. 1060, ♂ ♀.

A black species with the abdomen centrally and most of the legs pale rufescent-flavous, the hind tibiae at their apices and extreme base infusate ferrugineous and palpi sub-testaceous. It is extremely similar to *C. falcator* though generally a little smaller with the hind femora distinctly more broadly pale at their apices, the apices of their tibiae conspicuously dark, the mesopleurae less strongly punctate with the striae before the dull speculum much coarser but finer and more obsolete, the dentiparal metathoracic carinae rather more determinate and the palpi paler. Length, 12-16 mm.

At once known by the hind pedal colouration.

Sweden, east and west Gothland, Upland and Lapland (Holmgren), north and central Europe (Thomson); but I know no records outside Scandinavia. In September, 1900, Dr. Phillip Mason kindly gave me two females, which were captured at Greenings in Surrey, near East Grinstead, during June, 1871, by Mr. Wilson Saunders, but the species has not hitherto been noticed as British. Three males in my collection are from Piffard's and Capron's collections, and the *Campoplex* recorded by me in error as *C. tenuis*, Först. (E.M.M. 1910, p. 39) from the Isle of Soay by Skye.

6. *oxyacanthae*, Boie.

Ichneumon compressus, Christ, Naturg. 1791, p. 369, pl. xxxix, fig. 2 (?). *Campoplex oxyacanthae*, Boie, Stett. Ent. Zeit. 1855, p. 104, ♂; Holmgr. Bih. Sv. Ak. Handl. 1872, p. 60; Thoms. xi. 1060; Kriech. Prog. Gym. Pola, 1895, p. 36, ♂ ♀. *C. mesoxanthus*, Först. Verh. z.-c. Ges. 1868, p. 791, ♂ ♀.

Head hardly constricted posteriorly; face with flavidous pubescence, frons carinate, palpi and centre of mandibles rufescent flavous. Mesopleurae strongly punctate, with smooth and strongly nitidulous interstices; metathoracic impression with acute transrugosities. Abdomen with segments two to four flavous, the second discally black to beyond its centre and the fourth apically black; petiole with lateral impressed lines and no foveae, postpetiole usually apically pale; fifth segment of ♂ usually laterally flavous. Legs pale flavous with the coxae, trochanters, base of intermediate and whole of hind femora black; anterior coxae and trochanters partly flavous. Wings slightly clouded; areolet sessile or in ♂ sometimes shortly petiolate, and the recurrent nervure emitted at or shortly before its centre. Length, 12-14 mm.

The transrugose petiolar area and apically black fourth segment at

once distinguish it from *C. falcator*, without having recourse to the elevated oral costa.

This species has been too much mixed with *C. falcator* to ascertain its distinctive range and hosts, but Thomson states it to be distributed over north and central Europe; France, Belgium in July and August, and at Breda in September; raised from *Caradrina pulmonaris* by Mocsáry, originally from *Miselia oxyacanthae* by Boie; and from larvae of *Dasychira pudibunda*, *Acronycta* sp., *Hylophila prasina* and *Phalera bucephala* by Brischke (Schr. Nat. Ges. Danz. 1880, p. 139). With us Bignell bred it from *Himera pennaria* on the 10th and 19th August (cf. Entom. 1883, p. 65, l.c. 1884, pl. ii., fig. 6, and Brischke), Fitch from *Fidonia piniaria* (l.c. 1883, p. 65, et 1884, pl. ii., fig. 24); the cocoon is either hard, smooth, cylindrical, black-veined and brown or cylindrical, woolly and drab-coloured (l.c. 1885, p. 18). With us this species appears confined to woods; W. Ellis has found it in the New Forest, whence Adams has twice given it me in June from Lyndhurst; Buckell has taken it at Romsey in Hants, Piffard at Felden in Herts, and Mason has bred it at Pelham Wood near Caister in Lincs. from *Himera pennaria*. On 29th May, 1902, I took a female flying to a birch twig in the Bentley Woods near Ipswich, which looked exactly like a member of the vespid genus *Odynerus* on the wing.

7. *angustatus*, Thoms.

Campoplex angustatus, Thoms. O.E. xi. 1061; Schm. Opusc. Ichn. ♂ ♀.

A black species with the head strongly constricted behind the eyes and most of the legs, with centre of abdomen, pale flavous. It is similar to *C. oxyacanthae* in its conformation and colour, but the head is very much more strongly narrowed behind the eyes with the vertex much less broad; like it, the hind tibiae are entirely flavous, but its tegulae are sometimes black. Length, 8–10 mm.

Thomson says it is sparingly distributed over north and central Europe, and adds that Kriechbaumer reared it (O.E. 1089) from *Sthanelia hippocastani*; in Germany, Schm. considers it rare. With us it is certainly commoner than the above species, it has been bred from *Cabera pusaria* at Kings Lynn in Norfolk (Bridgman) and taken in Wyre Forest in May, 1890 (Martineau); I have numerous examples from Greenings during June, 1871 (W. Saunders), Pyrford in June (Morice), Croydon (Brunetti), bred from a Yorks larva and taken at Grass Wood, Wharfsdale, on 7th Sept. (Porritt), Guestling in 1888 (Bloomfield), bred from *Geometrid* larva at Gunton Wood, Lowestoft (Campbell-Taylor), and from its own dull white and felted cocoon inside that of *Bupalus piniaria* at Withycombe near Taunton, which Slater sent in November, and excluded the imago the following year.

8. *terebrator*, Först.

Campoplex terebrator, Först. Verh. z.-b. Ges. 1868, p. 810; Holmgr. Bih. Sv. Ak. Handl. 1872, p. 34; Thoms. O.E. xi. 1062, ♂ ♀.

Head posteriorly constricted; mandibles and palpi black; frons not impressed above the scrobes; cheeks elongate. Antennae with the basal flagellar joints distinctly discreted, and the first half as long again as the

second, which is scarcely longer than broad. Thorax with mesopleurae closely punctate, and speculum nearly dull. Abdomen with apical half of second segment, the third except a lateral line and whole of fourth, red; terebra as long as the second segment, and longer than postpetiole. Legs red with all the coxae and trochanters, the intermediate femora to beyond centre and hind femora throughout, black; hind tarsi, with both extremities of their tibiae, piceous; posterior tibiae of ♂ rufescent flavidous; claws elongate and but slightly pectinate, extending beyond pulvilli. Wings with the stigma pale, areolet sessile or petiolate, emitting the recurrent almost before its centre; discoidal cell externally rectangular below. Length, 10–14 mm.

Scandinavia and Central Europe (Holmgr.); France (Gaulle). Common and widely distributed with us; Earham near Norwich in May (Bridg. Tr. Norf. Soc. 1894, p. 619); frequently bred from *Lepidoptera* by Clutton at Burnley, especially from Southport *Caradrina Morpheus* in 1906, and by Waterston in 1903 from its own elongate-oval, smooth and bronze-black cocoon at Tainuilt; Cockayne sent me three females, which had emerged on 3rd–5th May, 1907, from—doubtfully—*Hybernina progemma*. Miss Chawner has taken it several times in the New Forest, Piffard at Felden in Herts, Capron at Shere, Cassal at Ashby near Doncaster, Dalglish at Cadder near Glasgow on 11th June, 1900, and Elliott at Braemar on 19th and 22nd July, 1907. I have found it on mountain ash in Bentley Woods near Ipswich, during the first week in June.

9. nitidulator, Holmgr.

Campoplex nitidulator, Holmgr. Sv. Ak. Handl. 1854, p. 9; *lib. cit.* 1858, p. 36; Bih. Sv. Ak. Handl. 1872, p. 26; Först. Verh. z.-b. Ges. 1868, p. 871, ♂ ♀. *C. vindex*, Först. *lib. cit.* p. 808, ♂; *C. circumscriptus*, Först. *lib. cit.* p. 819, ♂; *C. martialis*, Först. *lib. cit.* p. 821, ♂ ♀; cf. Thoms. O.E. xi. 1062.

A black species with the abdomen centrally and legs partly red; hind tibiae not basally black; terebra short. It is recognised from its allies by the internally somewhat distinctly emarginate eyes, elongate cheeks, black or centrally rufescent mandibles, discally subnitidulous and less coarsely punctate thorax, the carina of the dentiparal metathoracic areae extending on either side as far as the areola which is transverse and laterally entire, the distinct and subquadrate basal area, less deeply excavate and not trans-sulcate petiolar area, the pale alar stigma and broad fenestra, the lateral sulci of first segment extending from its base to the spiracles with deeply impressed glymmae, the postpetiole with a fine lateral impressed line towards the spiracles, the third and fourth segments with apical margin of the second red, the tibiae and anterior femora red or in ♂ flavous and the hind tibiae only black at their apices. Length, 12–14 mm.

The basally red hind tibiae and much shorter terebra differentiate it from the last species.

Not unfrequent in central and southern Sweden in May, and taken in *copula*; Finland and Aix (Holmgr.); northern and central Europe (Thoms.); Belgium in July and August (Tosq.), France (Gaulle). Bred from *Eupithecia venosata* by D'Orville (Entom. 1885, p. 19). Capron had many unnamed from Shere; others in my collection are from Felden by Piffard, bred from *Lepidoptera* at Burnley by Clutton, and from *Lepidoptera* at Sevenoaks in Kent on 11th of July, 1907 (Mrs. Holmes); the New Forest

by Miss Chawner, in July by Adams; from Colintrave near Glasgow on 24th May, 1900, by Dalglish; Lyme Regis on 22nd April and Kilmore on 17th August (Beaumont) in Ireland, where Col. Yerbury took the female at Caragh Lake on 13th August, 1901, referred to by me (E.M.M. 1902, p. 55). The only Suffolk example is a female, which Elliott captured on the wing in the Bentley Woods on 21st June, 1901.

10. *myrtillus*, Desv.

Campoplex myrtillus, Desv. Cat. 1856, 99, ♂. *C. nobilitatus*, Holmgr. Bih. Sv. Ak. Handl. 1872, p. 19; Thoms. O.E. xi. 1064, ♀; Schm. Opus. Ichn. no. 18, ♂ ♀.

A nitidulous black species with no red abdominal marking, the calcaria curved and not elongate, and the hind tarsi flavescent. Head with the cheeks very short; mandibles rufescent flavous and face densely white-pubescent. Antennae with the joints discreted and the ♂ scape flavidous beneath. Abdomen immaculate black; petiole small with superficial lateral foveae and postpetiole broad; ventral plica basally flavous. Legs flavidous with the coxae, trochanters and hind femora black; anterior coxae and trochanters of ♂ pale; hind tibiae stramineous with their base narrowly and apex broadly nigrescent; outer calcar short and curved. Wings with stigma flavous and nervures nigrescent; discoidal cell distinctly a little acute externally below. Length, 11–14 mm.

One of the most conspicuous of the genus in its shining, subglabrous and entirely black abdomen with the petiolar glymmae small and not deep, the broad postpetiole and basally pale ventral plica, in the colouration of its hind legs and their curved calcaria. Holmgren's name has not before been synonymised with that of Desvignes, but an examination of the latter's typical male in the National Collection, which was "reared from *Anarta Myrtilli*," at once revealed their identity.

The two females, originally described from Sweden, were captured by Thomson. I have seen a single male of this species,* sent for determin-

* No adequate description of the ♂ is extant. The following was drawn from Bradley's specimen in 1900:—

Head black; occiput and frons exceedingly finely scabrous and nude, latter somewhat excavated above antennae; with rather dense grey pubescence behind the eyes; eyes distinctly emarginate level with the antennae; face convex, closely and coarsely punctured and quite hidden by very long grey, silky, deflexed pubescence; clypeus a little raised, truncate and immarginate at the apex; mandibles broad, acutely but shortly bifid at the apex, entirely flavous excepting the teeth which are infusate, the inner hardly longer than the outer, (mandibles) with scattered punctures and pilosity, nitidulous; maxillary palpi flavous, paler towards the apex, pilose quadri-articulate, first joint somewhat incrassate; labial palpi flavous, pilose, three-jointed; second joint nodose apically. Antennae 10 mm. in length, of uniform thickness, entirely black, scape scabrous and pilose. Thorax black; dorsum of metathorax finely scabrous-punctate, finely bordered throughout from prothorax to scutellum; mesopleurae finely, distinctly, but not very regularly punctured and somewhat uneven, not divided from mesosternum by a ridge; mesosterna rather more regularly and a little more finely punctured, slightly depressed and transversely bordered posteriorly, their interpectoral sulcus transverse and not widened behind; metathorax scabrous with areae somewhat indefinitely demarcated in the centre. The areola is confluent with the petiolar area which is strongly transversely scabrous and feebly longitudinally carinate at its apex; superoexternae are divided from dentiparae, which bear no teeth, by an extremely indefinite line; postero-intermediae and externae are subobsolete; spiraculiferae and pleurales strongly marked; the spiracles are large and elongate-oval. Scutellum and post-scutellum black, somewhat elevated, rugose, immarginate, with erect, not very dense, grey pubescence. Abdomen, except the obsoletely ferrugineous apices of the two basal segments, entirely black, extremely finely punctured and haired, pilosity becoming thicker towards the apex; first segment with inconspicuous spiracles at its apical third, just beyond which it is somewhat protuberant dorsally, and transversely slightly depressed at its apex; second segment slightly depressed at the base and apical third; third glabrous at the apex; eight segments exerted; apically truncate; with central fold on four basal segments below, of which 2–3 are bright saffron-yellow. Legs bright yellow; front coxae at the base, intermediate above, and the whole of hind coxae and femora black; posterior trochanters and base and apex of tibiae infusate; all coxae, trochanters and femora finely punctured; all tibiae finely externally setose. Wings hyaline; areolet large triangular-quadrant; stigma ferrugineous; costa and nervures piceous with former, as well as radix, fulvous; tegulae flavous. Length, 11½ mm.

ation by R. C. Bradley from Birmingham early in 1900, bred from *Xanthia citrigo*, upon the strength of which I introduced it as British in my 1901 Paper read before the Ent. Soc. in ignorance of the above synonymy. A female has been recently presented to me by E. C. Bedwell, who captured it during June, 1908, in Sherwood Forest; and there is an indigenous female in the British Collection from Clifton's and a German one from Ruthe's.

11. *femorator*, Bridg.

Campoplex femorator, Bridg.-Fitch, Entom. 1885, p. 17; Bridg. Trans. Ent. Soc. 1886, p. 347; Schm. Opusc. Ichn. ♂ ♀.

Head with the mandibles centrally, and in ♂ palpi, flavous; face punctate and pubescent; frons reticulate and dull with a vertical carina; and posteriorly suboblique. Antennae with basal flagellar joints not discreted. Thoracic mesonotum finely punctate; mesopleurae punctate, with the interstices subreticulate and not dull; mesosternum with an apical vertical transcarina; metanotum nitidulous and irregularly rugose, with disc much smoother; dentiparal areae determinate. Scutellum punctate and only basally margined. Abdomen smooth and shining; postpetiole laterally rounded and broader than petiole; second segment apically, and the shorter and ventrally straight third fulvidous or castaneous, the base below of the laterally darker fourth concolorous; second and third segments laterally black-lined; terebra somewhat longer than a third of first segment. Legs black with anterior, except basally and basal half of intermediate femora, red or in ♂ flavidous; hind legs with the knees (or in ♂ apical half of femora) and centre of tibiae rufescent or in ♂ flavidous. Wings hyaline with areolet distinctly petiolate and emitting recurrent nervure slightly before its centre; stigma rufescent; tegulae fulvous, of ♀ rarely black; nervellus intercepted at its lower fifth; basal radial abscissa of hind wings half as long again as recurrent nervure. Length, 10-19 mm.

I possess a pair named by Bridgman, of which the male is a co-type given by him to Dr. Capron, and from it I have been enabled to place this species, the salient features of which in modern classification of the genus are omitted from the long and rambling original description.

"I have seen several specimens from Mr. Harwood, of Colchester, who could not give the host or the locality; also a female from Mr. Bignell, taken in Devonshire" (Bridg. *l.c.*); the latter specimen was bred from an unknown host on 24th May, but Lyle has raised it in the New Forest from *Boarmia extersaria*. Females in my collection were captured by Piffard at Felden in Herts and by Bloomfield in 1889 at Guestling in Sussex. On 18th May, 1901, a male of the minimum size had emerged from its own cylindrical, pale brown and somewhat smooth cocoon, which Wiggin took from the pupa of *Taeniocampa* sp. on 31st October, 1900, at Methley near Leeds.

12. *cultrator*, Grav.

Campoplex cultrator, Gr. I.E. iii. 616; Holmgr. Sv. Ak. Handl. 1858, p. 36; Bih. Sv. Ak. Handl. 1872, p. 18; Förster, Verh. z.-b. Ges. 1868, p. 776; Brischke, Schr. Nat. Ges. Danz. 1880, p. 140; Thoms. O.E. xi. 1065, ♂ ♀.

A black species with the abdomen narrowly red-cinctured and the legs fulvous-marked, with the hind femora entirely or apically pale. Head

dull with griseous pubescence; clypeus apically slightly emarginate; cheeks very short. Basal flagellar joints not at all discreted. Thorax dull and griseous-pubescent, with propleurae striate below; metathorax broad and deeply impressed longitudinally in the centre. Abdomen with only a narrow castaneous girdle, usually comprising apex of second and base of third segments, the latter is occasionally nearly entirely concolorous or black with only its base rosy; lateral foveae of basal segment deeply impressed, glymmae small; postpetiole laterally somewhat rounded. Legs black with the femora and tibiae red, excepting more or less of the hind femora basally; hind tibiae of ♀ flavous and distinctly spinose; claws hardly extending beyond pulvilli. Length, 10–12 mm.

It is similar to *C. pugillator* but a little stouter, with the head and thorax hirsute, clypeus slightly emarginate, the metathoracic excavation broad and deep, abdomen less broadly red, and the ♀ tibiae obviously spinulose. It was known as British to the older authors, but I had until 1912 seen nothing like it, unless indeed *C. femorator* be synonymous, which I am far from believing to be improbable.

Silesia, Hanover, Berlin, Sikershausen, Parma, and on a wall at Gottingen on 24th May (Grav.); very rare in Sweden (Holmgr.); France (Gaulle); Belgium in May, June, July and October (Tosq.). The cocoon is said by Brischke to be "elliptisch, dickwandig, braun." Practically nothing has been known of this species in Britain hitherto, but now I am able to confirm its occurrence with us since Mr. G. T. Lyle has kindly given me a female from the New Forest, where he dug up its cocoon at the base of an oak tree.

13. *pugillator*, Linn.

Ichneumon pugillator, Linn. S.N. 1758, 565; Berkenhout, Outlin. Nat. Hist. Gt. Brit. 1769, 165; De Geer, Abh. Gesch. Insect. 1778, pl. vi. fig. 11 et 12. *I. occisor*, Schr. Beitr. Naturg. 1776, p. 90; En. Austr. 362. *I. compressus*, Sulz. Abgek. Gesch. Ins. 1776, pl. xxvi. fig. 15; Schr. F.B. 268. *I. subfalcatus*, Gmel. S.N. 1790, 2701. *I. nidulator*, Thunb. Mem. Peters. Acad. 1822, p. 320; *I. latrator*, Thun. Bull. l.c. 1822, p. 269. *Ophion pugillator*, Fab. E.S. Suppl. 1798, 238; Piez. 136; Duméril, Mém. Paris Acad. Sc. 1860, p. 895. *O. latrator*, Fab. Piez. 135. *O. nidulator*, Panz. Krit. Revis. 1806, 89; F. G. 1809, 100. *Campoplex pugillator*, Gr. I.E. iii. 606; Holmgr. Sv. Ak. Handl. 1858, p. 34; Först. Verh. z.-b. Ges. 1868, p. 816; Thoms. O.E. xi. 1066, ♀. *C. areolator*, Holmgr. l.c. 1854, p. 8, ♂.

A black species with the centre of abdomen broadly, and legs partly, red; fifth segment entirely or mainly red, and frons tuberculate. Head alutaceous, finely punctate, dull and not explanate behind eyes; frons slightly impressed above scrobes, finely carinate centrally, with a small but conspicuous elevated tubercle on either side of scrobes in the ocular emargination. Antennae immaculate black, extending to near centre of abdomen, and apically attenuate; basal flagellar joints not at all discreted. Thorax alutaceous, finely punctate and dull; mesopleurae not shining; metathorax but slightly impressed and neither strongly nor regularly trans-striate centrally; the divergent sides of basal area alone carinate. Scutellum finely punctate, dull and laterally margined to centre. Abdomen black with segments two to five dark red, only the second basally and rarely apex of fifth black; lateral sulci of basal segment deeply impressed before the spiracles; terebra reflexed and very shortly exerted. Legs black with the anterior tibiae, front femora and apices of the intermediate,

fulvous; hind tibiae broadly dull red in their centre, and subintumescent internally before their base; claws not longer than pulvilli. Wings hyaline with the stigma and tegulae black, the former often internally rufescent; areolet distinctly petiolate, not broader than long, emitting the broadly fenestrate recurrent nervure from its centre; external angle of discoidal cell subacute below; nervellus intercepted at its lower third. Length, 10–12 mm.

This species is to be recognised by its more finely punctate and laterally half-margined scutellum, by the entirely or mainly red fifth segment, by the apically slightly impressed frons, the vaguely and sometimes hardly impressed metathorax and dull mesopleurae. Besides this there is the beautiful character of the juxtascribal tubercle, which appears, however, to appertain to the female only, for both Thomson and I have failed to ascertain the true male of this species, though doubtless its characters are comprised in the above description of authors, amplified from my own females.

Since writing the above I have seen a male, captured in Suffolk at the end of April by Col. Nurse, which certainly does bear juxtascribal tubercles, though they are much smaller and less conspicuous than those of the female.

Very little that is reliable can be recorded concerning this species, and the extent of its distribution is hardly known. Ray and Berkenhout, Fabricius and Gravenhorst all record it from Britain; but it is certainly far less prevalent both here and abroad than was formerly thought. Acomb Wood in 1881 (Wilson, Trans. Yorks. Nat. Union, 1882, p. 105), common at Glanvilles Wootton (Dale), Isle of Man (Walk. Entom. 1872, p. 432). "It is impossible to say what has not been included under *C. pugillator*," as Fitch remarks (Entom. 1885, p. 18), but as a matter of scientific fact this species as now restricted is by no means common with us; I have a few females found by Marshall at Nantes in France, by Bloomfield at Guestling 1876, by Dalglish at Loss near Glasgow early in June, 1900, and a female by Bouskell at Glenbeigh in Co. Kerry during June, 1902; but the majority are from the New Forest where Miss Chawner and Mr. Adams find it not rarely in June and July about Lyndhurst; I swept one in Knight Wood there in the middle of June, 1907, and W. Ellis has also given it me from the Forest. Tuck took a single male of but 9 mm. at Tostock in Suffolk.

C. pugillator is reputed to have been raised from the following hosts, none of which I believe to be at all reliable. *Cirrhoidea ambusta* and *Phalera bucephaloides* by Moesáry; *Aporia crataegi* by Reissig (Ratz. Ichn. d. Forst. i. 98 et iii. 88); *Zygaena ? filipendulae* by De Geer, larvae of *Z. rhodamanthus*, as well as *Selidosema taeniolaria* and *Halias quercana*, by Giraud (Ann. Soc. Fr. 1877, p. 404); from *Odontopera bidentata*, *Anticlea rubidata*, *Notodonta dictaeoides*, *Hecatera dysodea* and *Cucullia sp.* by Brischke (Schr. Nat. Danz. 1880, p. 139; 1891, p. 65; 1892, p. 44); from *Gnophos obscurata*, *Chimatobia brumata*, *Heliothis marginata* and *H. dipsacea*, and *Halias quercana* by Drewson and Boie (Wieg. Arch. 1839, p. 40, et Stett. Ent. Zeit. 1855, p. 104); from *Gonophora derasa* by Rothlieb, and from *Phibalocera quercana* by Gravenhorst. In Britain it is recorded by Bignell from *Amphydasis betularia*, and on 6th April from *Taeniacampa populati* (Entom. 1883, p. 65), *Corycia temerata*, *Cymatophora ridens*, *Eupithecia abbreviata* on 4th May and *E. absynthiata* on 11th July (l.c. 1885, p. 19); Fitch has confirmed Linnaeus' breeding of it from *Notodonta ziczac*

(*l.c.* 1880, p. 68); Eedle raised it with some doubt from *Thecla betulae* (*l.c.* 1883, p. 65); and I have seen a male which I can ascribe to no other species, bred by G. W. Mason from *Eupithecia oblongata* at Barton-on-Humber.

14. *foveolatus*, Först.

Campoplex foveolatus, Först. Verh. z.-b. Ges. 1868, p. 818; Thoms. O.E. xi. 1068, ♀; Thoms. *l.c.* xvii. 1863, ♂. *C. trisculptus*, Holmgr. Bih. Sv. Ak. Handl. 1872, p. 39; Bridg.-Fitch, Entom. 1885, p. 16, ♂ ♀.

Black with an abdominal cincture and part of legs red, the abdomen nitidulous and a little pubescent. Abdomen with the second segment apically and laterally, the third entirely, and the fourth except discally, red. Legs rufescent flavous with the coxae trochanters, intermediate femora to beyond their centre and hind ones entirely, black; anterior tarsi with base and apex of hind tibiae piceous. Length, 10–12 mm.

Of the size of *C. pugillator* but with the mesopleurae shining, less coarsely punctate, and speculum glittering, the stigma flavescent, areolet large and broad, emitting the recurrent nervure far before its centre, abdomen strongly nitidulous with glymmæ of basal segment large and deeply impressed, and the metathoracic excavation apically transrugose. Legs of ♂ with less red coloration, and the abdomen less shining.

Stockholm, Gothland, uncommon in Sweden (Holmgr.). Porritt first took it in Britain at Doncaster in May, 1884 (*cf.* Tr. Ent. Soc. 1886, p. 345); but it is not rare with us, and I have examples from the New Forest (Miss Chawner), Lynmouth in Sept. (Charbonnier), bred from a *Lepidopterous* larva in Yorks in May, 1891 (Porritt), Guestling in 1890 (Bloomfield), and Sherwood Forest in the middle of June, 1903 (Tomlin). It has occurred to me in the Queens' Bower and Wilverley Inclosure in the New Forest, where Lyle has bred it from *Cabera pusaria*, as well as in Stanstead Wood in Suffolk on 30th May, 1898, by sweeping herbage.

15. *xenocamptus*, Först.

Campoplex xenocamptus, Först. Verh. z.-b. Ges. 1868, p. 804; Brisch. Schr. Nat. Ges. Danz. 1880, p. 140, ♀; Holmgr. Bih. Sv. Ak. Handl. 1872, p. 67; Thoms. O.E. xi. 1071, ♂ ♀.

A black species with the mouth, tegulae, centre of abdomen and part of legs pale; third segment shortly black-lined laterally, metathorax hardly arcated and nervellus geniculate above its centre. Head with the frons feebly carinate centrally. Thoracic pronotum striate below; mesosternum dull, coarsely but not strongly punctate and alutaceous; metathoracic impression somewhat deep and trans-strigose towards its apex; spiracles elongate. Abdomen with third and fourth segments entirely, with apex of second broadly, red; apical margin of postpetiole usually concolorous; lateral petiolar foveae small but distinct; terebra somewhat short, with its valvulae narrow and apically hardly paler. Legs fulvous with the coxae, trochanters, intermediate femora except apically and the hind ones entirely, black; hind tarsi, with base and apex of their tibiae, piceous; claws short and a little pectinate. Wings with the stigma fulvous, areolet petiolate and emitting recurrent nervure a little before its centre; nervellus geniculate above centre. Length, 10–11 mm.

Instantly recognised by the nervellus being geniculate or intercepted distinctly above its centre and a little postfurcal.

Described from Germany by Förster, and found in Sweden by Holmgren. It was introduced as British by Bridgman (Tr. Norfolk Naturalists' Soc. 1894, p. 619) and said by him to have been captured by Thouless at Market Drayton in Norfolk. I have seen nothing like it.

16. *anceps*, Holmgr.

Campoplex pugillator, var. *anceps*, Holmgr. Sv. Ak. Handl. 1858, p. 35, ♀. *C. disparilis*, Först. Verh. z.-b. Ges. 1868, p. 790, ♂ et *C. auriculatus*, Först. l.c. p. 840, ♀. *C. anceps*, Holmgr. Bih. Sv. Ak. Handl. 1872, p. 42, ♂ ♀. *C. auriculatus*, Thoms. O.E. xi. 1071, ♂ ♀.

A black species with the abdomen centrally rufotestaceous, second segment basally black, legs partly red or in ♂ mainly stramineous; and the impressed frons with scrobes auriculate. Mesopleurae strongly punctate, finely alutaceous and feebly nitidulous; metathorax but slightly impressed, densely grey-pubescent, with obsolete basal areae. Abdomen with the second to fourth segments except basal mark on former red, or in ♂ fulvidous; black lateral lines on third elongate; basal segment with small but distinct lateral foveae; terebra short, with valvulae narrow. Legs of ♀ with apical half of the front femora, their tibiae and tarsi fulvous, intermediate femora apically and their tarsi partly concolorous; legs of ♂ mainly flavescent with anterior coxae basally, hind coxae and trochanters and femora black with base and apex of their tibiae piceous. Wings with the areolet petiolate and not broad, emitting recurrent nervure nearly from its centre. Length, 8–10 mm.

Known by the strongly impressed frons, the elongate lateral black lines of the third segment and the extension of rufescent colouration on the second; but especially by the auriculately elevated antennal scrobes, which resemble those of certain species of *Tryphon*.

North and central Europe (Thomson), France (Gaulle); described from East Gothland, taken on 19th August; Finland, Germany and England (Holmgren); bred in Prussia from larvae of *Eupithecia actaeata* by Brischke (Schr. Nat. Danz. 1880, p. 140). Introduced as British by Marshall (Ent. Ann. 1874, p. 143) on the strength of a single Devonshire specimen. Heighan Osier Carr in Norfolk during August and bred by Bignell from *Pelurga comitata* (Bridg.-Fitch). I took a male by sweeping reeds in a brackish ditch on the Suffolk coast at Southwold on 11th September, 1907, and Dr. Cassal has given me another, found on 29th June, 1900, at Ashby near Doncaster.

17. *confusus*, Först.

Campoplex confusus, Först. Verh. z.-b. Ges. 1868, p. 841; Holmgr. Bih. Sv. Ak. Handl. 1872, p. 62; Thoms. O.E. xi. 1072, ♂ ♀.

A black species with the legs partly and the compressed abdomen centrally broadly flavous, including apex of basal segment. Head narrowed behind the eyes, with the palpi piceous. Prothorax striate below; mesopleurae dull and densely punctate, with alutaceous interstices; metathorax somewhat shallowly impressed, with basal area usually indistinct. Scutellum acutely margined on either side at its base. Abdomen black

with apex of postpetiole always, apical half of second and whole of third and fourth segments red; third segment with no or obsolete lateral black line. Legs flavidous with the coxae, trochanters, intermediate femora to beyond their centre and the hind ones except apically, black; apices of both the hind tibiae and tarsi nigrescent; ♂ with anterior coxae flavous-marked, and hind tibiae also basally infusate. Wings with the tegulae piceous, stigma rufescent, areolet high and narrow, usually shortly petiolate, with recurrent nervure emitted slightly beyond its centre. Length, 10–12 mm.

Besides the peculiar colouration of the postpetiole, this species may be known by the posteriorly narrow head, subcontinuous genal costa, slightly impressed frons, inferiorly strigose propleurae, dull and not strongly punctate mesopleurae, but little excavate metathorax with obsolete areae, pale stigma, elongate areolet emitting recurrent beyond centre, the unusually strongly compressed abdomen with its broadly flavous centre and the mainly concolorous legs.

Not common in north and central Europe (Thoms.) and bred from *Selenia tetralunaria* by Kriechbaumer (O.E. 1089); France (Gaulle), rare in Belgium in July (Tosq.). Bred in south Devon on 28th March from *Taeniocampa populeti* by Bignell (Entom. 1885, p. 20); Norwich (Bridg.). I have seen no member of this genus with the postpetiole pale, and the specimens here placed owe their position solely to the centrally flavous body and stramineous hind tibiae: two males have been given me by Piffard from Felden in Herts and a female by Bankes, who bred it on 27th June, 1904, out of *Macaria liturata* from Delamere Forest.

18. *lapponicus*, Holmgr.

Campoplex lapponicus, Holmgr. Sv. Ak. Handl. 1858, p. 37; Först. Verh. z.-b. Ges. 1868, p. 872; Holmgr. Bih. Sv. Ak. Handl. 1872, p. 51; Thoms. O.E. xi. 1073, ♂ ♀. *C. callizonus*, Först. l.c. p. 803, ♀. *C. greeni*, Cam. Spolia Zeylanica, 1905, p. 127, ♀.

A black species, with centre of abdomen and part of legs rufescent. Head hardly at all constricted posteriorly, closely punctate and densely argenteo-pubescent; frons not impressed, scrobes simple; mandibles unicolorous ferrugineous throughout, and basally white pubescent; palpi dark testaceous. Antennae immaculate. Thorax distinctly and closely punctate; basal metanotal areae not wanting; pleurae less closely punctate than mesonotum, propleurae sinuately and obliquely striate centrally and below, central impression of mesopleurae closely and regularly striate apically. Abdomen black, with the third to fourth or fifth segments bright red; terebra exerted. Legs black with the front tarsi, tibiae and apices of their femora testaceous; calcaria concolorous. Wings hyaline, with the stigma infusate and the nervures black; areolet triangular and shortly petiolate, emitting recurrent nervure before its centre; nervellus geniculate below its centre; basal abscissa of radius hardly half as long again as recurrent nervure. Length, 9–12 mm.

It is a slender species with the abdomen strongly compressed, the pleurae not very coarsely punctate and somewhat shining, the vertex broad, genal costa continuous and the cheeks subbuccate.

One of the most widely distributed of the genus, extending to India whence I have seen it from Darjiling in October, Mussoorie in June,

Simla in the middle of May and Kasauli about the same time, all at an altitude of between six and seven thousand feet; but it is not confined to the north-west for it reaches Ceylon, whence Cameron described it as a new species. It is not rare in damp meadows in central and southern Lapland in July and August; France, Sweden and Denmark. It was discovered to be British by Fletcher, who bred two females and five males from Stornoway *Melanippe hastata*; "the cocoons are palish brown, sometimes ashy and uniform in tint" (Bridg. Tr. Ent. Soc. 1889, p. 420). Much less common than the following: Herts (Piffard), Surrey (Capron), Braemar on 24th July, 1907 (Elliott); and twice bred by Clutton at Burnley from *Hypsipetes impluviata* and Southport *Eupithecia* sp.—the cocoons are elongate oval and dull brown. It has occurred to me at Dunwich in Suffolk on 1st June, 1905; hovering about a rose-bush in my Monk Soham garden on 30th May, 1909, and early in the following July at Brockenhurst in the New Forest.

19. *bucculentus*, Holmgr.

Campoplex bucculentus, Holmgr. Sv. Ak. Handl. 1858, p. 35; Först. Verh. z.-b. Ges. 1868, p. 871; Thoms. O.E. xi. 1073, ♂ ♀. *C. melampus*, Först. l.c. 783, ♂ ♀.

Head broad and hardly at all narrowed behind the eyes. Pronotum not striate; mesonotum somewhat nitidulous and not closely punctate; metathorax and scutellum as in the last species. Abdomen with third and fourth, with apex of second segment, red; the third with short lateral black lines; basal segment with no lateral foveae; terebra subelongate. Legs dead black with only the front ones partly dull red; ♂ coxae and trochanters flavous-lined above. Wings with the areolet subsessile, emitting recurrent nervure slightly beyond its centre; stigma nigrescent. Length, 10–12 mm.

Known by its broad vertex and somewhat broad cheeks, unstriolate pronotum, sparsely but somewhat strongly punctate mesosternum, black tegulae, subexcavate and not strigose metathorax with suboval and not large spiracles, the abdominal colour, somewhat stout legs with their claws longer than pulvilli and pectinate to apex; but especially by the entirely black posterior legs, of which the ♀ rarely has the hind tibiae badious.

Both sexes were originally taken in Sweden between 13th and 25th July; Finland and Germany (Holmgren); France (Gaulle); rare during August in Belgium (Tosq.); and bred from larvae of *Lomaspilis marginata* and *Odontopera bidentata* by Brischke (Sch. Nat. Danz. 1880, p. 140); Colonel Nurse at Tuddenham on 6th July, 1910 and Mocsáry also raised it from *Heliothis dipsacea* and Bridg.-Fitch say from *H. marginata* by Brischke; north and central Europe, and bred from *Chariclea* (*Pyrrhia*) *Umbra* (Thoms.). First noticed as British by Fletcher in the middle of August at Deal (Tr. Ent. Soc. 1884, p. 426); Cromer in August (Bridgman). It is by no means an uncommon species with us and I have a long series, a dozen of which contains both sexes and was bred by Norgate in 1902 out of *Heliothis marginata* at Tuddenham in Suffolk; their cocoons are dark ochreous, dull and very woolly; Colonel Nurse bred it from the same host in July, 1912, as well as from *Chesias partialis* at Ampton in west Suffolk on 23rd May, 1910. Banks raised a male from a similar cocoon out of Delamere Forest *Odontopera bidentata* in

1903. Tostock in Suffolk in early September (Tuck); Redland near Bristol in July (Charbonnier); Yorkshire (Porritt), Kingsdown in Kent, August (Sladen), Botusfleming in Cornwall and Nantua in France (Marshall), West Runton, Norfolk in August, 1900 (Wainwright), Shere (Capron) and Greenings in Surrey (Saunders). Throughout August, 1901, I found this species sparingly in Matley Bog in the New Forest, always upon the flowers of *Angelica sylvestris*; and on 9th August, 1897, a female occurred on flowers of umbels in the Little Blakenham chalk pit, near Ipswich.

20. *punctatus*, Bridg.

Campoplex punctatus, Bridg. Trans. Ent. Soc. 1886, p. 345, ♂; cf. Bridg.-Fitch, Entom. 1885, p. 16; Schm. Opusc. Ichn. no. 55, ♂.

Head oblique behind the eyes; face dull, finely punctate and pubescent; palpi black, mandibles centrally broadly flavous; frons finely granulate, with no carina. Thorax with mesonotum somewhat coarsely but not deeply punctate, interstices reticulate; mesopleurae somewhat coarsely and closely punctate, with glabrous interstices; metanotum irregularly rugose and nitidulous, with areola well-defined and its carinae elongate. Scutellum sparsely and not finely punctate, laterally margined to beyond its centre. Abdomen dull, pubescent and black with the second segment red or obscurely castaneous apically, third red and usually with its base discally infusate, fourth red and usually with its centre discally or its apical half black; third segment two-thirds length of second, convex below, with no lateral black line; basal segment slender and reticulate, with postpetiole apically subexplanate and spiracles slightly prominent. Legs black with front ones partly fulvidous; intermediate tibiae and tarsi pale castaneous. Wings with stigma (in my co-type) luteous; radix and tegulae piceous; areolet petiolate, emitting recurrent nervure before its centre; nervellus subgeniculate at its lower third, emitting no nervure. Length, 9.5 mm. ♂ only.

It appears to differ little from *C. lapponicus*, except in the capital conformation, which is not clearly expressed in the description; I possess a ♂ co-type from Capron's collection and find the head hardly less buccate than that of *C. bucculentus*, which it very strongly resembles, differing mainly in the more deeply impressed metathorax, the paler stigma and much smaller alar areolet.

"Taken by Mr. Harwood" (Bridg. *loc. cit.*), probably about Colchester. Mr. Van Burgst records the female (Tijds. v. Ent. 1911, p. 11) from The Hague in September.

21. *juvenilis*, Först.

Campoplex juvenilis, Först. Verh. z.-b. Ges. 1868, p. 779; Bridg.-Fitch, Entom. 1885, p. 16; Schm. Opusc. Ichn. no. 46, ♂ ♀

A black species with the abdomen centrally and the legs, except only basally, fulvous; hind femora pale; third segment not laterally black-lined. Head transverse and posteriorly constricted; mandibles and palpi flavous; frons distinctly carinate centrally. Thorax with the mesopleurae finely and closely punctate, the interstices alutaceous; apical half of the

central metathoracic impression acutely transrugose. Abdomen black with the third segment entirely, apex of the second and sides of the fourth fulvous; third segment with no elevated lateral margin nor black lines, or with the latter obsolete. Legs fulvous with only the coxae and trochanters black, the anterior of the ♂ being partly flavous; hind femora fulvous in both sexes, rarely subinfusate at base and apex. Wings with the areolet petiolate, tegulae fulvous and nervellus hardly geniculate. Length, 7-9 mm.

Our only species with the head transverse, frons carinate, basal abscissa of hind wing radius short, postpetiole black and scrobes simple; the pale hind femora are peculiar. It was thought by Thomson (O.E. xi. 1082) to possibly be a form of *C. disseptus*, Först. l.c. p. 833 = *C. monozonus*, Först. l.c., p. 781, which in turn Holmgren considered in 1872, p. 52, synonymous with his own *C. floricola* of 1858, p. 38, though not with Gravenhorst's type of that name.

Not known in northern Europe and probably incorrectly recorded from Britain; it is however found in France according to Gaulle, and Tosquinet considers it to occur rarely in Belgium during July. Our only specimen was named by Bridgman and bred in south Devon on 16th June from *Eupithecia nanata* by Bignell (Trans. Devon. Assoc. Sc. 1898, p. 490).

22. *costulatus*, Bridg.

Campoplex costulatus, Bridg. Trans. Ent. Soc., 1886, p. 346, ♂; cf. Bridg.-Fitch, Entom. 1885, p. 17; Schm. Opusc. Ichn. no. 48, ♂.

Head laterally oblique behind eyes; mandibles flavous and palpi fulvous; frons dull and granulate, conspicuously carinate centrally, with five carinae radiating from antennal base; face dull, rugose, pubescent and indistinctly punctate. Thorax with mesonotum finely and sparsely punctate, with interstices subglabrous; mesopleurae normally punctate, with interstices reticulate; metanotum subnitidulous with disc obsoletely punctate, the central impression not very deep and its apical part feebly transrugose; areola well defined, dentiparal areae externally obsolete. Abdomen finely punctate and pubescent, black with the third segment, the fourth except apically, and the second except a lateral line and disc at apex, clear red; basal segment slender with postpetiole apically sub-explanate and spiracles not prominent; third segment as long as second, laterally black-lined but not concave beneath; ventral segments concolorous. Legs flavous with base of anterior coxae castaneous, their femora subrufescent; hind coxae, trochanters, and femora black, with their tarsi and both extremities of their tibiae piccous. Wings with radix and tegulae fulvous, stigma castaneous; areolet shortly petiolate and emitting recurrent nervure before centre; nervellus nearly straight, subintercepted far below its centre. Length, 11 mm. ♂ only.

The peculiar frontal structure appears to render this species distinct.

"One specimen taken by Mr. Harwood" (Bridg. l.c.), perhaps about Colchester; the type is probably in Bridgman's collection in the Norwich Castle Museum. This species is still unknown on the Continent, and entirely so to me.

23. *leptogaster*, *Holmgr.*

Campoplex leptogaster, Holmgr. Sv. Ak. Handl. 1858, p. 38; Bih. Sv. Ak. Handl. 1872, p. 41; Thoms. O.E. xi. 1078; Först. Verh. z.-b. Ges. 1868, p. 872, ♂ ♀. *C. macrostylus*, Först. l.c. p. 812, ♀.

Head posteriorly constricted; mandibles and palpi flavidous; frons somewhat deplanate, with its central carina subobsolete. Thorax with the central metathoracic impression very superficial; basal area complete, dentiparal internally indicated. Abdomen very slender and longer than head and thorax, black with the third and fourth segments entirely, base of fifth and apex of second red; third segment laterally black-lined nearly to its apex; basal segment linear and nearly straight; terebra shortly exerted. Legs flavidous fulvous with the coxae and posterior femora, except apices of the intermediate, black; the castaneous hind tibiae nigrescent at both extremities; ♂ with the front legs flavous and only the coxae basally black. Wings with stigma and tegulae piceous; areolet small, irregular and shortly petiolate, emitting recurrent nervure distinctly beyond its centre; basal nervure subcontinuous through the median. Length, 9 mm.

Known by its peculiarly slender form, entirely red fourth segment, complete discal metanotal area, irregular areolet, continuous basal nervures and discally stramineous base of anterior tibiae.

Originally found by Boheman at Bleking (Holmgr.); north and central Europe (Thoms.), and bred by Brischke from larvae of *Cabera pusaria* in Prussia (Schr. Nat. Danz. 1880, p. 144). Found to be British by Bridgman at Eaton near Norwich in May (Trans. Norfolk Nat. Soc. 1894, p. 619). I possess a series, comprising both sexes, found about Shere in Surrey by Dr. Capron, together with a remarkable male variety, agreeing in every way with the typical form except that the hind trochanters, femora, tibiae and tarsi are totally fulvous. It does not seem by any means common with us, though Lyle has bred it from so ubiquitous a host as *Hybernia ruficaparia* in the New Forest and tells me it spends nine months of the year in its cocoon.

24. *incompletus*, *Bridg.*

Campoplex incompletus, Bridg. Trans. Ent. Soc. 1889, p. 420; Schm. Opusc. Ichtn. no. 56, ♂.

A black species, with only the front legs and centre of abdomen rufescent. Head transverse and laterally subparallel; palpi infusate, frons with no carina. Thorax dull, with mesonotum closely punctate and the interstices reticulate; mesopleurae dull and densely punctate; metathorax dull and finely rugose with no trace of areae, its central impression not deep and sides white-pubescent. Scutellum sparsely and not finely punctate, laterally margined to its centre. Abdomen black with the third and fourth segments entirely, and apex of second, red; postpetiole laterally a little rounded and about double length of the apically sub-explanate petiole, spiracles not prominent; third segment convex below and about three-quarters length of second. Legs black with the front ones except basally, and intermediate tibiae with apices of their femora, flavidous red. Wings with tegulae black and stigma nigrescent; areolet

petiolate, emitting recurrent nervure just beyond its centre; basal abscissa of hind wing radius slightly longer than the recurrent; nervellus not geniculate. Length, 8 mm. ♂ only.

Distinct in its total lack of metathoracic areae and entirely black hind legs.

Described from a single male in Bridgman's collection, taken on 6th June, 1888, at Eastbourne in Sussex (Bridg. *loc. cit.*). A male, captured by Ernest A. Elliott at Shoeburyness in Essex on 18th June, 1902, agrees with the description in every way excepting in its possession of basal metanotal carinae, though no areae.

25. *erythrogaster*, Först.

Campoplex erythrogaster, Först. Verh. z.-b. Ges. 1868, p. 836; Holmgr. Bih. Sv. Ak. Handl. 1872, p. 56; Thoms. O.E. xi. 1078, ♂ ♀. *C. indefessus* et *C. affixus*, Först. l.c., p. 799, ♂

A somewhat small black species with the abdomen except basally, and anterior legs partly, rufescent. Head transverse and a little narrowed posteriorly; mandibles rufescent before their apices, palpi piceous; cheeks short; frontal fovea broad, smooth and strongly nitidulous. Thorax with propleurae strongly transrugose beneath; mesopleurae closely and finely punctate, with interstices alutaceous and speculum somewhat nitidulous; metathorax not deplanate, with its central impression somewhat deep and extending nearly to base. Scutellum a little convex and laterally margined only to its centre. Abdomen brick-red, with the first and the second segment except its apex black; ♂ with the sixth and seventh nigrescent above; basal segment with linear lateral foveae and very narrow postpetiole; third laterally black lined; terebra short and reflexed. Legs black with the anterior or front tibiae and tarsi, and their femora except apices of intermediate, red; ♂ with anterior femora more broadly red and their tibiae flavescent; calcaria pale and elongate; acetabulae bilobed. Wings with tegulae black and stigma fulvidous; areolet shortly petiolate, emitting the recurrent nervure from its centre. Length, 8-9 mm.

Thomson distinguishes this species and *C. aversus*, Först. (*Tscheki*, Holmgr.) from *C. fatigator*, Först. (*dubiosus*, Först.), to which Bridgman considered his own *C. incompletus* most closely related, by the mesosternal epinemia being distinctly inconspicuous with the acetabulae elevated behind the front coxae. The outer nervure of the areolet is peculiarly incurved below.

Sweden, Aix and Stollberg (Holmgr.), bred from *Lobophora polycommata* by Kriechbaumer (Thoms. O.E. 1090), very rare at Beverloo in Belgium during August (Tosq.). Very common in Norfolk (Bridgman), bred in south Devon on 24th April from *Hybernia rupicaprararia* by Bignell (Entom. 1885, p. 20). This is a common species with us, though I have seen none bred; Capron had a full series from Shere, Piffard took it at Felden, Tuck in June, 1900, at Tostock on *Chacrophyllum temulum* flowers, Bloomfield at Guestling, Miss Chawner in the New Forest, and Marshall at Cornworthy in Devon. Elliott swept it from hedge-bottoms in Wicken village, Cambs, June, 1902; and it has occurred to me at Louth in Lincolnshire, Winterton in Norfolk; and both Tuddenham Fen and the Bentley Woods in Suffolk during the same month and end of May, among young hazels and whitethorn, sometimes by sweeping at dusk.

26. *monozonus*, Först.

Campoplex floricola, Holmgr. Sv. Ak. Handl. 1854, p. 10, excl. syn.; *lib. cit.*, 1858, p. 38, ♂ ♀ (?). *C. monozonus*, Först. Verh. z.-b. Ges. 1868, p. 833; Holmgr. Bih. Sv. Ak. Handl. 1872, p. 52; Thoms. O.E. xi. 1081, ♂ ♀. *C. disseptus*, Först. *lib. cit.*, p. 781.

A small and slender black species with abdomen narrowly red, legs partly fulvous, and the terebra elongate. Head transverse and not strongly constricted posteriorly; face infusate-pubescent, genal costa sinuately continuous, mandibles weak and apically narrowed, frons not carinate, ♂ mouth flavous. Antennae hardly longer than half body, stout and not apically attenuate. Thorax with propleurae shining and obviously striolate below; mesosternal epicnemial almost wanting and acetabulae centrally bilobed; metathorax not deplanate, its central impression apically broad and deep, strongly rugose; basal areae subdistinct; spiracles small. Abdomen compressed and somewhat narrowly red centrally, with the second segment apically concolorous above; petiole not linear; terebra somewhat elongately exserted, nearly as long as basal segment. Legs fulvous, their base and nearly always hind femora black; hind tibiae nigrescent at both extremities; ♂ with apices of the anterior coxae and of front trochanters pale. Wings with the tegulae flavous and stigma pale; radial cell broad; radius emitted from centre of stigma, its apical abscissa not inflexed and a little longer than the basal; lower basal nervure somewhat postfurcal; areolet oblique, emitting recurrent nervure beyond its centre. Length, 6-7 mm.

This species has, doubtless, been mixed in British collections with *C. juvenilis*, and it has not hitherto been noticed to occur with us; or possibly mistaken for *C. alticola*, Grav., which differs from it in having the coxae and trochanters, mandibles and palpi of both sexes black, the third segment nearly entirely red, the tegulae not pale and the ♀ antennae shorter and stouter; the latter has been recorded as British by Marshall under the erroneous genus *Limneria*, but he cannot have known it or he would not have there placed it.

It has a wide distribution through north and central Europe (Holmgr.), but has not hitherto been noted as British; it is, however, somewhat common with us, and appears to nearly always be found upon the flowers of umbelliferous plants. A score of specimens, including both sexes, first occurred to me on *Heracleum sphondylium* flowers in the Minsmere Level marshes near Kessingland in Suffolk on 12th July, 1900; subsequently I found it on *Daucus carota* at Eye at the end of August, and on umbels growing in the ruined nave of Dunwich church on the Suffolk coast early in July, on *Angelica sylvestris* in Tuddenham Fen and Icklingham marshes towards the end of August in the same county, where Tuck has taken both sexes at Bungay and Tostock in September, during which month E. A. Butler has sent me the male from Guildford in Surrey.

27. obreptans, Först.

Campoplex obreptans, Först. Verh. z.-b. Ges. 1868, p. 778, ♀ (*nec* Holmgr.); *C. acmulus*, *C. parvulus*, *C. discrepans*, Först. *lib. cit.* pp. 794, 865, 867, ♂ ♀. *C. filicornis*, Holmgr. Bib. Sv. Ak. Handl. 1872, p. 80, ♀. *C. acmulus*, Thoms. O.E. xi. 1082, ♂ ♀.

A black species with the abdomen apically cyaneous, its centre and most of legs red; terebra short. Head but slightly constricted posteriorly; face with testaceous pubescence; palpi and part of mandibles fulvous. Antennae somewhat stout and hardly longer than half body. Thorax with the propleurae nitidulous and distinctly striate below; mesopleurae rugosely punctate; acetabulae centrally bilobed; metathorax with the basal areae distinct and the central impression deep, broad and coarsely rugose. Abdomen black with the third segment entirely, the fourth partly, and the second apically above, red; ventral plica infusate; anus black with distinct blue reflection; petiole with lateral foveae and the postpetiole narrow; terebra short. Legs fulvidous with coxae and trochanters black, and both extremities of hind tibiae piceous; hind femora vary from entirely fulvous to entirely black. Wings with stigma and part of tegulae fulvous; areolet subsessile, emitting recurrent nervure beyond its centre; radial cell broad with apical abscissa of radius straight and hardly longer than the basal; lower basal nervure a little postfurcal. Length, 6–8 mm.

Our only species with the anus at all blue, excepting *C. sobolicida*; the short radial cell is distinctive; but the colouration of the hind femora is very variable.

Not very common with us, though taken at Harting in Sussex by Beaumont in the middle of August and both sexes have been bred by Banks on "1st–3rd June, 1900, from larvae of *Eupithecia venosata*, Fb., collected at Salisbury in 1899"; by Clutton from *Lepidoptera* at Burnley in 1907. I have taken a couple of females on oak in Staverton Thicks in Suffolk on 24th June, 1903, and in the Wilverley Inclosure in the New Forest on 9th July, 1909.

28. disclosus, Först.

Campoplex disclosus, Först. Verh. z.-b. Ges. 1868, p. 837; Thoms. O.E. xi. 1082; Schm. Opusc. Ichn. no. 66, ♀.

A black species with the anus not at all cyaneous, the abdomen centrally with anterior femora and tibiae fulvous, hind tibiae black at both extremities and the terebra shortly exerted. Length, 8 mm. ♀ only.

It is said by Thomson to be very similar to *C. obreptans* in its size, the capital, antennal, thoracic and abdominal structure, but with the last strongly compressed with its second segment more broadly red, the stigma somewhat narrow and emitting almost before its centre the radial nervure, which is a little sinuate towards its base. The British records are probably founded on the pleural conformation; the propleurae are shining and obviously striolate, transrugose below their centre; the mesopleurae are somewhat coarsely punctate; and, as in the last species, both the mesosternal acetabulae are centrally bilobed, and the central meta-thoracic impression is broad and deep with strong rugosities.

Thought by Thomson to be nearly confined to central Germany. Earham near Norwich in September and bred by Fletcher from *Eupithecia*

expallidata (Bridg. Tr. Norf. Soc. 1894, p. 619). Certainly uncommon; Beaumont took it at Kilmore in Ireland in the middle of August, 1898; Tuck on 25th August, 1900, at Benacre Broad in Suffolk, where I have seen it flying about a whitethorn hedge at Mildenhall in the middle of June, 1899, at South Elmham in September, and beneath oaks at Wilverley in the New Forest. Dr. R. T. Cassal has given me a female bred from *Eupithecia oblongata* during 1901 at Medge Hall, Doncaster.

29. *zonellus*, Först.

Campoplex zonellus, Först. Verh. z.-b. Ges. 1868, p. 850, ♀; Thoms. O.E. xi. 1083, ♂ ♀. *C. curynotus*, Holmgr., Bih. Sv. Ak. Handl. 1872, p. 75, ♂ ♀.

Head posteriorly constricted; genal costa sinuately continuous in front; mandibles obsoletely red-marked, weak and apically narrowed; palpi castaneous. Antennae not very long, with their apices not attenuate. Thorax with pronotum shining and striolate below on either side; mesopleurae densely punctate, alutaceous and quite dull; mesosternal acetabulae simple, not bilobed; metathorax not deplanate, with the areae obsolete or entirely wanting, its central impression alutaceous to centre and thence slightly transrugose; spiracles somewhat short, suboval. Abdomen black with the second segment apically above, third entirely and part of the fourth red; ventral plica basally infusate; basal segment with lateral foveae; terebra but shortly exerted, its valvulae not apically pale. Legs fulvous with coxae, trochanters, base of front femora, the intermediate except at apices and whole of hind ones, black; hind tibiae centrally pale, piceous broadly at both extremities. Wings with the tegulae nigrescent; areolet petiolate and emitting recurrent nervure beyond its centre; radial nervure emitted before centre of the castaneous stigma. Length, 5-7 mm.

It is very similar in size and the structure of the whole body to *C. obreptans*, but the acetabulae are simple, the antennae a little longer though not apically attenuate, the apical metathoracic sculpture is not rugose and its central impression is broader and more indefinite, the third segment is entirely and the fourth mainly or hardly with only extreme apex of second red, the areolet is oblique but not sessile, the legs more or less red or flavous marked but the hind femora are always black. The short terebra and dark tegulae distinguish it from *C. monozonus*.

Norway, Sweden and probably all Scandinavia (Holmgr.), and central Europe (Thoms.). Bred at King's Lynn in Norfolk from *Eupithecia pulchellata* by Atmore (Bridg.); from *Thecla betulae* by Eedle (Entom. 1885, p. 20); and captured on 8th June at Bickleigh in Devon (Bignell). I have found this species only in the New Forest during June and July, at Matley Bog, Wilverley Inclosure and in a Lyndhurst garden. A male in my collection is one of "three bred from larvae of *Oecophora albimaculella* in Shetland, 1902," by J. A. Clark.

30. *sobolicida*, Först.

Campoplex sobolicida, Först. Verh. z.-b. Ges. 1868, p. 860; Thoms. O.E. xi. 1085, ♂ ♀. *C. ulceratus*, Holmgr. Bih. Sv. Ak. Handl. 1872, p. 83, ♂ ♀.

Head with the vertex somewhat broad; cheeks not elongate, and the genal costa not sinuately continuous but sublaminate elevated in front;

face short, somewhat coarsely but not closely punctate; eyes internally subemarginate; mandibles partly pale, somewhat stout and hardly narrowed apically. Antennae elongate and apically attenuate, with the joints there not discreted; basal flagellar joint half as long again as the second. Thorax with pronotum laterally rugose; mesopleurae somewhat strongly but not very coarsely punctate; metathoracic impression deep, densely and arcuately trans-striolate; areae wanting. Abdomen black with the second segment a little longer than third and its apical half red, with the three (except disc of fifth) following and the ventral plica concolorous; basal segment with small lateral foveae, postpetiole narrow and subparallel-sided; terebra short. Legs fulvous with coxae, trochanters, intermediate femora to beyond their centre and the hind ones entirely, black; hind tibiae piceous at both extremities. Wings with areolet narrow and subsessile, emitting recurrent nervure from its centre; radial nervure apically slightly sinuate; radial cell narrow, emitting areolar nervure from its centre; discoidal cell apically rectangular below. Length, 8-9 mm.

This species is distinct in its metathoracic structure, the third and fourth with nearly apical half of second segments red and remainder with cyaneous reflections, the spiracles somewhat elongate, areolet high and emitting recurrent nearly from its centre, the striolae before mesopleural speculum distinct, hind tibiae obviously spinulose, the face short and strongly punctate.

France, Germany and Stockholm. "*Campoplex subolicita*, Fst.," is recorded from Felthorpe in Norfolk during June by Bridgman (Tr. Norf. Soc. 1894, p. 619), with no note as to its novelty as British.

31. *tenuis*, Först.

Campoplex tenuis, Först. Verh. z.-b. Ges. 1868, p. 851, ♀; Holmgr. Bih. Sv. Ak. Handl. 1872, p. 69; Thoms. O.E. xi. 1087, ♂ ♀.

A black species with the abdomen centrally, and the legs partly, red in ♀ or flavous in ♂; ventral plica infuscate; vertex somewhat incrassate; petiole attenuate, with no lateral sulci; and the radius obviously sinuate apically. Length, 7-9 mm.

This species is known by the head being but slightly constricted behind the eyes, the pronotum not striolate below, the metathorax almost excarinate, with its central impression trans-strigose, the radial cell narrow with its inner nervure distinctly inflexed apically, the lower basal nervure a little postfurcal, the basal segment with neither lateral sulci nor impressed lines and petiole gradually merging into the postpetiole, the second segment apically broadly with the third and fourth entirely or in ♂ except apex of the latter red, ventral plica infuscate, the anterior legs red-varied with the ♂ anterior coxae apically pale, the face quadrate and somewhat densely griscopilose. Sometimes the hind femora are red beneath and badious above. It differs from the following species in having the second segment but slightly longer than the third; and from the last in its much more finely punctate mesopleurae and not laminately elevated genal costa.

Aix-la-Chapelle (Förster), central and southern Sweden (Holmgr.),

France (Gaulle), Belgium rare in July (Tosq.). Bridgman was doubtful of its identity: "Mr. Fitch sent me three *Campoplex* which I believe to be this species, and I have two in my own collection" (Tr. Ent. Soc. 1886, p. 345), doubtless those recorded from Eaton and Earham near Norwich in July (Tr. Norf. Soc. 1894, p. 619). Tuck took males at Finborough Park in Suffolk in September, 1900; I have found females in Tuddenham Fen towards the end of August, 1905, on *Tanacetum vulgare* at Covehithe on the Suffolk Coast on 6th September, 1910, and a male flying about a hedge at Halesworth early in June, 1900.

32. *Mariae*, Schm.

Campoplex annexus, Först. Verh. z.-b. Ges. 1868, p. 780, excl. ♂. *C. facialis*, Holmgr. Bih. Sv. Ak. Handl. 1872, p. 77; Thoms. O.E. xi. 1068, ♂ ♀ (*nec* Boie, 1857). *C. Mariae*, Schm. Opusc. Ichn. sp. no. 82, ♂ ♀.

A small slender black species, with centre of abdomen broadly and the legs nearly entirely fulvous, recurrent emitted from centre of areolet. Length, 6–7 mm.

This species is known by its slender form, flavous or subinfusate stigma, black or stramineous ♂ tegulae, fulvous femora and tibiae of which the hind ones are generally black above at their apices, apically fulvous coxae and trochanters, sinuate and nearly continuous genal costa, laterally shining and striolate pronotum, and the not coarsely though very obviously punctate mesopleurae. It is distinguished from the two last species in having the second segment very evidently longer than the third, and the fifth partly fulvous; the slender hind femora also fulvous; the radial nervure apically gently sinuate, with radial cell narrow; the head constricted posteriorly with very short cheeks and small mandibles; the antennae elongate and slender; and areolet petiolate. Förster's ♂ is a distinct species, Holmgren's name is preoccupied, and Schmiedeknecht has adopted that of Dalla Torre's Catalogue.

Thomson only knew Förster's type, which was captured at Aix-la-Chapelle; and it has thrice been taken by Tosquinet in Belgium during August. *C. facialis*, Holm., is recorded from "Norwich" by Bridgman (Tr. Norf. Soc. 1894, p. 618). I have a male in Capron's collection from Shere in Surrey; Tuck took another in Finborough Park in Suffolk on 24th September, 1900; and a female was swept by Elliott in Tuddenham Fen, at the end of August, 1902.

SAGARITIS, Holmgren.

Holmgr. Sv. Ak. Handl. 1858, p. 39; Ofv. 1858, p. 324.

Head very rarely buccate behind the glabrous eyes, which are very slightly emarginate at the juxta-antennal orbits; clypeus basally not discredited, its apex mucronate or with the centre of its apical margin denately produced; mandibles with subequal teeth; genal costa nearly continuous, but wanting in front. Scape immaculate black. Metathorax not longitudinally impressed; areae nearly always complete; spiracles small and circular. Abdomen subcompressed towards its apex, black or rarely

centrally red; petiole deplanate with small but distinct lateral sulci; postpetiole broad, discreted and subdeplanate, with no lateral scrobes but fine lines from apex to spiracles and usually castaneous marks; seventh segment entire; terebra exerted and usually short. Legs normal; tarsal claws slender and extending beyond pulvilli. Wings with small, regular and elongately petiolate areolet, emitting recurrent nervure nearly from its centre; discoidal cell usually apically acute below; stigma not broad; tegulae pale; nervellus geniculate.

Schmiedeknecht remarks that this genus may be recognised by the geniculate nervellus and peculiarly regular areolet, without examining the remarkable and distinctive clypeal process. He allows *Campoplex ebeninus*, Grav., to stand in both *Anilastus* and the present genus; the British insect has the clypeus apically mutic, and is that described by Thomson under the former.

This is the only Campoplegid genus with the apex of the clypeus dentately produced. The abdomen is never rufescent at either base or apex, though its centre is usually so coloured, and there more broadly laterally than discally; the terebra is always distinctly exerted, though not longer than half abdomen and, if longer than basal segment, obviously reflexed; the legs are not slender, their tarsi not stout, the hind coxae are always black and their tibiae usually more or less infusate at apex and before base; the head and thorax dull and, except the oral organs, immaculate black, as also are the scapes with the exception of one or two males. I do not find, however, any reliable character but the central apical clypeal tooth.

Table of Species.

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|-------|---|------------------------------|
| (4). | 1. Discoidal cell apically rectangular below; ventral plica basally nigrescent. | |
| (3). | 2. Antennae distinctly stout; hind tibiae subunicolorous red | 1. BRACHYCERA, <i>Thoms.</i> |
| (2). | 3. Antennae slender; hind tibiae piceous at both extremities | 2. AGILIS, <i>Holmgr.</i> |
| (1). | 4. Discoidal cell apically acute below; abdominal plica more or less clear stramineous. | |
| (16). | 5 Capital vertex somewhat broad; terebra reflexed, never shorter than first segment | |
| (9). | 6. Hind femora black; vertex not at all narrow. | |
| (8). | 7. Abdomen broadly red, more than double length of terebra | 3. DECLINATOR, <i>Grav.</i> |
| (7). | 8. Abdomen narrowly red, less than double length of terebra | 4. FEMORALIS, <i>Grav.</i> |
| (6). | 9. Hind femora red; vertex less broad. | |
| (13). | 10. Centre of abdomen more or less distinctly red. | |
| (12). | 11. Areola elongate; third segment discally red throughout | 5. RAPTOR, <i>Zett.</i> |
| (11). | 12. Areola subquadrate; third segment discally black-marked | 6. HOLMGRENI, <i>Tschek.</i> |
| (10). | 13. Whole abdomen entirely black throughout. | |

- (15). 14. Hind tarsi not white-marked; metanotal areola elongate 7. *POSTICA*, *Bridg.*
 (14). 15. Hind tarsi half white; metanotal areola transverse 8. *PUNCTATA*, *Bridg.*
 (5). 16. Capital vertex narrow; terebra nearly straight, never longer than basal segment.
 (18). 17. Abdomen entirely red centrally; hind tibiae immaculate 9. *ERYTHROPUS*, *Thoms.*
 (17). 18. Abdomen immaculate black or central segments only partly red.
 (24). 19. Central segments more or less broadly red.
 (23). 20. Recurrent nervure emitted distinctly before centre of areolet.
 (22). 21. Hind tibiae black, centrally and basally white 10. *MACULIPES*, *Tschek.*
 (21). 22. Hind tibiae red, with base and apex nigrescent-marked 11. *ZONATA*, *Grav.*
 (20). 23. Recurrent nervure not emitted before centre of areolet 12. *LATRATOR*, *Grav.*
 (19). 24. Central segments black, at most with incisures pale.
 (26). 25. Postpetiole trifoveolate between spiracles; femora red 13. *INCISA*, *Bridg.*
 (25). 26. Postpetiole simple; hind femora basally or entirely black 14. *ANNULATA*, *Grav.*

1. *brachycera*, *Thoms.*

Sagaritis brachycera, Thoms. O.E. xi. 1091, ♂ ♀.

A black species with the legs partly pale and the hind tibiae red; metathorax rugosely punctate; terebra nearly straight and almost shorter than basal segment. Length, 4–5 mm.

It may be known by the short and stout antennae, shining and obviously punctate mesopleurae, the black abdomen with its nigrescent ventral plica; the clypeus is somewhat convex, mucronate and short, with somewhat large lateral foveae; red femora and tibiae; black mandibles, coxae and trochanters; stramineous tegulae and the areolet emitting recurrent nervure very slightly beyond its centre, with the apical radial abscissa a little longer than the basal.

Described from Borgholm in the Baltic Isle of Oland, and thought by Thomson to occur through central and southern Europe; Gaulle has recorded it from France and Schm. finds it very commonly in Thuringia. It has been taken by Bridgman at Earlham near Norwich in July (Trans. Norf. Nat. Soc. 1894, p. 619).

2. *agilis*, *Holmgr.*

Sagaritis agilis, Holmgr. Sv. Ak. Handl. 1858, p. 47, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 147, ♂; *lib. cit.* 1891, p. 66; Thoms. O.E. xi. 1091, ♂ ♀.

A black species with the legs, except basally, red; hind tibiae infusate at both extremities; terebra shorter than basal segment. Length, 5 mm.

This differs from the preceding in having the hind tibiae black at both base and apex, antennae less stout with the basal flagellar joints hardly discreted *inter se*, the mesopleurae subalutaceous; abdominal ventral plica less infusate, the mandibles centrally or in ♂ nearly entirely stramineous, with the ♂ hind femora apically black.

Uncommon in central and northern Europe; Sweden early in June (Holmgren); Prussia (Brischke); France (Gaulle); and Belgium in August and September (Tosquinet). It was found by Bridgman (Trans. Norf. Soc. 1894, p. 619) at Earlham near Norwich in July.

3. declinator, Grav.

Campoplex declinator, Gr. I.E. iii. 589, ♀; Holmgr. Ofv. 1854, p. 17, ♂. *Porizon mediator*, Zett. I.L. i. 395, ♂ ♀. *Sagaritis declinator*, Holmgr. Sv. Ak. Handl. 1858, p. 43; Brisch. Schr. Nat. Ges. Danz. 1880, p. 146; Thoms. O.E. xi. 1092, ♂ ♀.

Black with apices of central segments, and their sides more broadly, castaneous-red; anterior legs fulvous, with their base and the hind ones black; hind tibiae red with apex and before the base black; vertex not narrow. Length, 6–7 mm.

A large species with the vertex stout, not narrow; metathoracic costulae wanting, radius emitted from centre of the flavous stigma, external angle of discoidal cell strongly acute below; terebra fully as long as half the abdomen, which has the second segment short, and the third and fourth sometimes nearly entirely red.

Not a rare species in northern Europe, and conspicuous on account of its large size; Gottingen, Silesia, etc., in mid-September; Lapland; frequent in Sweden; Neustadt; and France. It has long been known as British and has been bred in south Devon by Bignell on 25th March; and again (Entom, 1883, p. 66) by him from *Limacodes asellus*. The cocoon is described by Bridg-Fitch (*l.c.* 1885, p. 102) as of $3\frac{1}{4} \times 1\frac{3}{4}$ lines, cylindrical and unicolorous brown. I have two males in Dr. Capron's Surrey collection.

4. femoralis, Grav.

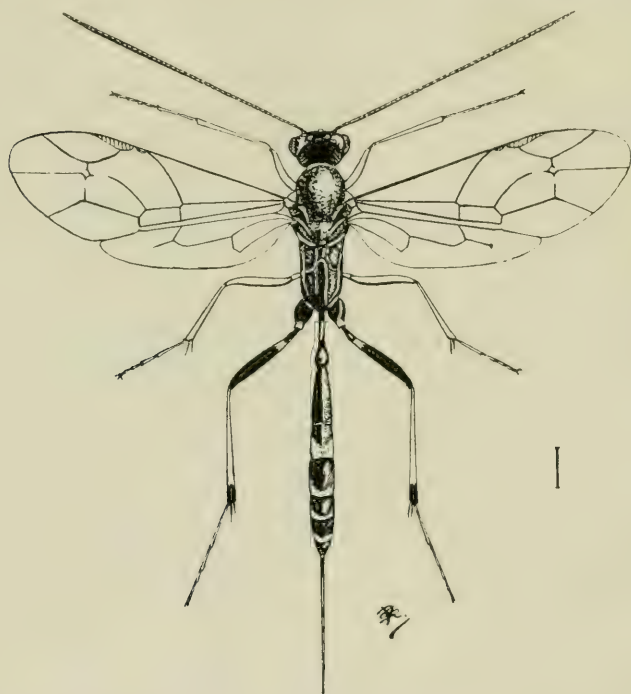
Campoplex femoralis, Gr. I.E. iii. 592, ♀. *Limneria femoralis*, Bridg-Fitch, Entom. 1885, p. 207, ♂ ♀. *Sagaritis laticollis*, Holmgr. Sv. Ak. Handl. 1858, p. 46; Brisch. Schr. Danz. 1892, p. 45; Bridg-Fitch. Entom. 1885, p. 101, ♂ ♀. *S. femoralis*, Thoms. O.E. xi. 1092, ♂ ♀.

Black with the legs a little flavous and white varied, the abdomen red-cinctured and nearly double length of terebra. Length, 5 mm.

The body is very narrow, the hind legs black with base and centre of their tibiae broadly white and internally black, the front femora are basally red and the intermediate more broadly black; metathoracic costulae obsolete or wanting, though areola complete; the vertex is broad and hardly at all constricted behind the eyes, and the longer terebra distinguishes it from *S. annulata*.

Not infrequent in southern Lapland, etc., in July and August, Belgium, Silesia, Prussia and Austria; bred by Kreichbaumer from *Plusia gamma* (Thoms. O.E. 1092). It was introduced by Bridg-Fitch on the strength of examples captured by Marshall at Bishops Teignton and Abergavenny;

and they add that Peter Inghald bred it from a less than half grown larva of *Mania typica*, found feeding on fuschia in Hull; its cocoon is of $3 \times 1\frac{1}{8}$ lines, brown, reticulated with black towards both extremities, and surrounded by brown flossy silk. Dalla Torre says Bignell also bred it from *Depressaria nervosella*; I cannot confirm the statement. It is apparently rare with us, though I have both sexes in Capron's Surrey collection, females in Piffard's from Felden in Herts and another of the same sex, which was swept at Matley Bog in the New Forest on 15th June, 1907.



Butler took it at Abinger Hammer in Surrey at the end of August, 1900; and Nurse raised both sexes on 27th–29th June, 1912, from *Emmelesia alchemillata* in West Suffolk.

5. *raptor*, Zett.

Porizon raptor, Zett. I.L. i. 395, ♀. *Sagaritis raptor*, Holmgr. Sv. Ak. Handl. 1858, p. 44; Brisch. Schr. Ges. Danz. 1880, p. 146; Tschek, Verh. z.-b. Ges. 1871, p. 46; Thoms. O.E. xi. 1093, ♂ ♀.

Black with the centre of abdomen broadly, and most of the legs, red; head narrow and the acetabulae strongly reflexed centrally. Length, 4 mm.

Differs from the preceding kinds in having the head constricted behind the eyes, the metanotal areola elongate and apically incomplete; the

femora and tibiae are red with both extremities of the hind tibiae black, and the terebra nearly half length of abdomen. The male antennae are much longer and more slender than those of *S. Holmgreni*.

Frequent in Scandinavian woods and fields (Holmgr.), but Thomson considered it rare and bred it "from a white-grey, irregularly black-banded butterfly pupa"; Austria (Tschek); France (Gaulle); and Belgium during July and August (Tosquinet). Bred from its cylindrical, hard, dull white cocoon, which has two zones consisting of black spots and the extremities strewn over with similar dots and spots, out of *Orgyia antiqua* in Prussia, together with a variety from larvae of *Eupethcia sobri-nata* and *E. campanulae*, by Brischke. This species is added to our fauna, without locality, by Bridg.-Fitch (Entom. 1885, p. 102); possibly on the strength of several examples of both sexes, found by Capron at Shere in Surrey, though hitherto unnamed; Chapman gave me a male, bred from its unicolorous dull white cocoon, out of *Gnophos variegata*, at Cara, Naples, during 1905; and on 12th June, 1908, I took another at Tuddenham village in Suffolk.

6. *Holmgreni*, Tschek.

Sagaritis Holmgreni, Tschek, Verh. z.-b. Ges. 1871, p. 50; Schm. Opusc. Ichn. no. 12, ♂ ♀. *S. fasciata*, Bridg. Trans. Ent. Soc. 1887, p. 366, ♂ ♀. *S. macroura*, Thoms. O.E. xi. 1093, ♂ ♀.

Head hardly constricted posteriorly; face white-pubescent; palpi and most of mandibles flavous. Antennae a little longer than half body. Thorax with mesonotum dull and densely alutaceous; metanotal areae usually indistinct, with areola about as broad as long. Abdomen with the second segment apically, the third and fourth almost entirely red with a basal discal nigrescent mark; remainder in ♀ laterally rufescent; second segment longer than broad, the third subquadrate; terebra hardly shorter than half abdomen. Legs fulvous with the front trochanters and apical joint of hind ones flavous; hind tibiae internally rufescent, basally white, apically and before the base nigrescent, externally centrally whitish in ♀ and rufescent in ♂. Wings with the tegulae flavous, stigma dull flavidous; areolet emitting recurrent nervure from, or slightly before, its centre; nervellus obsoletely geniculate. Length, 5-7 mm.

Hardly shorter though narrower than *S. declinator*, with the abdomen subcylindrical, the second segment longer than broad and apically, with the third and fourth except a subcircular discal mark, and the three following laterally, testaceous-red; the hind tibiae are internally red and externally nigrescent, with a basal band and the central third white; apical joint of hind trochanters stramineous and radius emitted far beyond centre of stigma. Bridgman adds that it differs from *S. maculipes* in the length of the third segment and terebra, which is unusually elongate; he considered his species, with which Thomson's is certainly synonymous, to differ from *S. Holmgreni* in the pedal colouration and broader head.

Sweden, central and southern Europe; Austria, France and very common in Thuringia. The type of both sexes of his new species were taken by Bridgman (*loc.*) together at Horning Ferry in Norfolk, during June, 1882; and he also records (Norf. Soc. Trans. 1894, p. 619) "*macrocera*, Thom.", doubtfully from Eaton near Norwich in August. Apparently

common; Capron had a long series from Shere in Surrey; and I have swept it in the middle of June, 1908, at Chippenham Fen in Cambs, in the middle of July in Beaufort Park near Hastings, at Wilverley and Rhinefields in the New Forest, Stonchenge and Grovelly Wood in Wilts.

7. *postica*, Bridg.

Sagaritis postica, Bridg. Trans. Ent. Soc. 1886, p. 350, ♀.

Head subbuccate with the face quadrate, genal costa distinct and clypeus apically acuminate; palpi and mandibles flavous, with teeth of latter equally long. Thoracic notauli obsolete; mesopleurae dull and partly aciculate, with their disc smooth and shining and a deeply impressed anterior sulcus; areola hexagonal, longer than broad and hardly complete apically; costulae distinct. Abdomen immaculate black with postpetiole thrice broader than petiole, longer than broad, subparallel-sided and broadest at the spiracles; second segment a third, and the third a little, longer than broad; terebra as long as basal segment; venter flavous and laterally more broadly infusate-marked from base to apex. Legs red with coxae black; trochanters flavous with most of their basal joint black and base of apical joint of the hind ones, together with extreme base of their femora, subinfusate; hind tibiae centrally flavous, subpiceous internally before their base; onychii infusate. Wings basally flavous, tegulae white and stigma pale piceous; areolet petiolate, emitting recurrent nervure before its centre; nervellus geniculate, and but obsoletely intercepted, a third from the bottom. Length, 7 mm. ♀ only.

"The colour of the legs easily distinguishes it from any species I am acquainted with," says Bridgman.

"One female taken by Mr. Harwood in the neighbourhood of Colchester" (Bridg. *l.c.*).

8. *punctata*, Bridg.

Sagaritis punctata, Bridg. Trans. Ent. Soc. 1886, p. 349, ♂ ♀.

Head transverse and somewhat oblique behind the eyes; face subpubescent; palpi red, mandibles centrally flavous or piceous with teeth of equal length; clypeus basally subdiscreted and apically acuminate. Antennae filiform, subattenuate apically, extending to apex of second segment. Thorax dull; mesopleurae somewhat nitidulous and finely reticulate, with their disc smooth and shining; metathorax somewhat short, rounded, with areae subdistinct; areola broader than long, dull, reticulate and obsoletely trans-striate, with apex obtuse. Abdomen elongate-ovate, in ♂ subcylindrical; postpetiole subquadrate, subparallel-sided, about length of petiole and about four times broader, of ♂ more slender; second segment a third longer than broad with the third quadrate in ♀, nearly twice longer than broad with the third elongate in ♂; anus subcompressed; terebra subreflexed and a little longer than basal segment. Legs slender and red with coxae, except sometimes apices of the anterior, and base of hind trochanters black; hind tibiae white with both extremities black, and an oval red mark at extreme base above; hind tarsi black, with their basal half and calcaria white. Wings with tegulae flavous and stigma infusate; areolet regular, petiolate and not longer than broad, emitting the recurrent nervure from or slightly before its

centre; radial nervure apically slightly curved; nervellus geniculate below its centre. Length, 5.5 mm.

The immaculate black abdomen is remarkable in the present genus.

The types were "bred by Mr. W. Cross, of Ely, from *Plusia orichalca*, April 19th, 1885. The cocoon is opaque, pearly white, with a faint band before each end" (Bridg. *l.c.*).

9. *erythropus*, Thoms.

Sagaritis erythropus, Thoms. O.E. xi. 1093, ♂ ♀.

A black species, having the abdomen centrally and the legs red with base of latter black. Length, nearly 5 mm.

Very similar to *S. raptor* in size and colouration, but with the terebra shorter, the hind tibiae with their tarsi entirely red, the second segment subtransverse and apically broader, and the mesosternal acetabulae not reflexed.

Thought to be not rare in northern and central Europe by Thomson, who bred it from "a straw-yellow butterfly pupa" in Sweden, but I know of no Continental records. Bridgman found it (Trans. Norf. Soc. 1894, p. 619) during May and June at Brundall in Norfolk. It seems very rare with us, and I have only met with the female which was swept at a damp spot in Dodnash Woods near Ipswich in the middle of September, 1901.

10. *maculipes*, Tschek.

Campoplex zonatus, var. 2, Gr. I.E. iii. 585, ♀. *Sagaritis zonata*, varr. 2 et 3, Holmgr. Sv. Ak. Handl. 1858, p. 45. *S. maculipes*, Tschek, Verh. z.-b. Ges. 1871, p. 49; Schm. Opusc. Ich. no. 10, ♂ ♀.

Head a little narrowed behind the eyes, with palpi and centre of mandibles flavidous. Thorax laterally and anus densely white-pubescent; areola complete and a little longer than broad. Abdomen with the third to seventh segments laterally more or less broadly red; the second somewhat narrow, half as long again as broad, dull, evenly and very closely alutaceous throughout; third not very smooth; ventral plica stramineous; terebra slightly shorter than basal segment. Legs rufescent with coxae and base of trochanters black; intermediate tibiae usually infusate at both extremities; hind femora nigrescent at base and apex, their tibiae whitish, infusate at apex and before base; hind tarsi nigrescent; in ♂ front coxae partly or entirely flavous. Wings with tegulae stramineous, stigma rufescent flavous; recurrent emitted from centre of areolet and nervellus obsoletely intercepted below its centre. Length, 6-7 mm.

This species resembles *S. zonata* in the metanotal areae and position of second recurrent nervure, but differs, besides its colour, in the more slender legs and antennae, densely pubescent abdomen and sculpture of the second segment.

A rare species in central Europe; about Breslau, etc., in July (Grav.); Austria (Tschek). Bridgman says of it (Trans. Ent. Soc. 1887, p. 367), "I have taken in the Norwich neighbourhood what I believe to be this species; it has also been bred by Mr. Fletcher from an unknown host. The cocoon is pearly white, with two indistinct zones of scattered black

dots." Not uncommon with us; the Rev. C. D. Ash has given me a male, bred on 1st July, 1900, from Selby *Agrotis agathina*; I have swept the same sex in the middle of May, 1902, at Gosfield in Essex, and in the middle of August, 1906, at Brandon in Suffolk; the female flew in to light after dark at Monk Soham House on 24th August, 1911; and Capron found both sexes in Surrey.

11. *zonata*, Grav.

Campoplex zonatus, Gr. I.E. iii. 584, ♂ ♀. *Sagaritis zonata*, Holmgr. Sv. Ak. Handl. 1858, p. 45; Tschek, Verh. z.-b. Ges. 1871, p. 47; Brisch. Schr. Nat. Ges. Danz. 1880, p. 146; Thoms. O.E. xi. 1094, ♂ ♀.

A black species with the abdomen and legs partly pale, the stigma infusate and the abdominal ventral plica dull stramineous. Length, 5 mm.

Very similar to the preceding species, though at once recognised by the colour of the ventral plica and the darker stigma, slightly shorter terebra, elongate calcaria, shorter metanotal areola, slightly reflexed mesosternal acetabulae, red hind femora, the internally concolorous and externally black tibiae, with their broad central white band, and the narrow vertex.

As widely distributed as *S. annulata*; taken in garden near Breslau in the middle of May, and in Silesia (Grav.); not uncommon in Scandinavia in July, becoming rarer in Lapland; Austria, Prussia, Belgium, France. It is said by Bridgman to be common in Norfolk; taken about Shere in Surrey during the summer of 1879 by Capron (Entom. 1880, p. 88); and in the Isle of Man (Walker, l.c. 1872, p. 432). Bred by Bignell from *Cheimatobia brumata*, and on 11th September from *Hecatera serena* in South Devon, by Cross from *Eubolia cervinaria*, and Fletcher from *Coleophora therinella* (Entom. 1885, pp. 102-3). Bridg.-Fitch ascribe four forms to the cocoon (l.c.):—1. Cylindrical, $3\frac{1}{2} \times 1\frac{1}{4}$ lines, hard, pearly white, semitransparent, without markings except a narrow opaque white central band, surrounded by a few slight silky white hairs; 2. Pale, flavitious white, subopaque, without markings (figured at Entom. 1884, pl. ii. fig. 2); 3. Opaque white, with faint black zonal markings; 4. Deep brown, rather rough, without markings, resembling the cocoon of *S. incisa*, but rather narrower and paler. I possess eleven in Capron's collection, though I have not taken it myself; Cockayne sent me two live males on 30th June, 1905, and the female a week later, all bred out of *Oporabia dilulata* at Rannoch.

12. *latrator*, Schr.

Ichneumon latrator, Schr. F.B. ii. 1802, 306, ♂. *Campoplex latrator*, Gr. I.E. iii. 586, ♂ ♀. *Sagaritis mitis*, Holmgr. Sv. Ak. Handl. 1858, p. 46, ♂ ♀. *S. latrator*, Tschek, Verh. z.-b. Ges. 1871, p. 48; Thoms. O.E. xi. 1094, ♂ ♀. (?) *Campoplex assimilis*, Gr. I.E. iii. 579, ♂; Ratz. Ichn. d. Forst. iii. 88, ♀; Holmgr. Sv. Ak. Handl. 1854, p. 17, ♂ ♀; *Limneria assimilis*, Holmgr. l.c. 1858, p. 70; Brischke, Schr. Nat. Ges. Danz. 1880, p. 163; Bridg.-Fitch, Entom. 1885, p. 207, ♂ ♀.

A black species with the abdomen and legs partly pale; anterior coxae flavous, with their base black; apical abscissa of the radial nervure nearly double length of the curved basal. Length, 6 mm.

From *S. zonata* and *S. annulata*, the present species is distinct in its

rather larger size, more strongly narrowed vertex, short metanotal areola, small alar fenestra, the stigma emitting radius almost from its centre, abdominal segments a little shorter with terebra a little longer, the anterior coxae pale in both sexes, the hind tibiae black with their centre broadly white, and the stramineous ventral plica.

A common European species; several on umbels in July and August about Gottingen, etc., and Austria (Grav.); but very rare in southern Sweden (Holmgr.). First recorded as British by Bridgman (Trans. Ent. Soc. 1882, p. 149). Bignell captured this species (Trans. Devon. Assoc. 1898, p. 490) at Bickleigh, on 20th August and 2nd September. Apparently very common in Surrey, whence I have a long series in Capron's collection, though none have elsewhere occurred to me.

13. *incisa*, Bridg.

Campoplex seniculus, Gr. I.E. iii. 473, ♂ (*nec* Ratz.); *Casinarina senicula*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 147, ♀ (?). *Sagaritis incisa*, Bridg. Trans. Ent. Soc. 1883, p. 165, ♀; *lib. cit.* 1889, p. 421, ♂.

Head transverse and very finely white-pubescent, narrow behind the eyes; face subquadrate; palpi rufescent flavous and mandibles centrally paler. Antennae a little shorter than abdomen and thorax. Thorax a little narrower than head, longer than high, with notauli somewhat distinct and extending to mesonotal disc; areola subhexagonal and sometimes apically incomplete, with costulae obsolete or wanting; petiolar area broad and not concave. Abdomen somewhat short and broad, with the second and third segments sometimes laterally pale-marked; post-petiole a little longer than broad, laterally subparallel, a little shorter and about thrice broader than the petiole, with three obvious discal foveae between and level with the spiracles; second segment somewhat longer than broad, often transimpressed at base and apex; remaining segments transverse; terebra half length of basal segment. Legs normal and red with coxae and base of posterior trochanters black; hind tibiae at both extremities, and their tarsi, infusate; trochanters of ♂ flavidous. Wings basally and the tegulae flavous; stigma infusate, narrow and elongate; areolet rhomboidal and obliquely quadrate, emitting recurrent nervure before its centre; lower basal nervure subcontinuous; nervellus geniculate though hardly intercepted below its centre. Length, 5 mm.

Gravenhorst's single Silesian male from flowers of *Chaerophyllum bulbosum* differs only in its obsolete areolet and larger size; though Brischke's Prussian female, bred from a pupa of *Orgyia gonostigma*, seems more distinct.

"Two females bred by Mrs. F. Norgate. The host is uncertain [given, without query, as *Anisopteryx aescularia* at Entom. 1885, p. 103]; the cocoon is elongate, and of uniform tawny brown. Mr. Fletcher has bred both sexes of this insect from *Eupithecia campanulata* from Sussex" (Bridg. *loc. cit.*). The cylindrical, $3 \times 1\frac{1}{4}$ lines, wrinkled, coriaceous and olive-brown cocoon is figured at Entom. 1884, pl. ii., fig. 12. Three males of this "exceedingly rare" species were bred from larvae of *Cleoceris viminalis*, Fb., by Mainsbridge (Proc. S. Lond. Ent. Soc. 1896, p. 85).

14. *annulata*, Grav.

Campoplex annulatus, Gr. I.E. iii. 493, ♀. *Limneria annulata*, Bridg.-Fitch, Entom. 1885, p. 107, ♀. *Sagaritis annulata*, Thoms. O.E. xi. 1094, ♂ ♀. Var. *fuscicarpus*, Kriech. Progr. Gymn. Pola, 1895, p. 40, ♂.

Black with the abdomen usually, and the legs partly, pale; hind femora mainly or entirely black, their tibiae white with two black marks. Length, 4-5 mm.

This species is easily known by the posteriorly narrow head, the elongate and entire metanotal areola, the flavous stigma emitting radial nervure beyond its centre with the nearly straight and not elongate apical abscissa of the latter, stramineous trochanters, the internally black tibiae which are externally white before their base and broadly white-banded centrally.

Common in north and central Europe, though Grav. only knew two females sent him from Silesia and Paris; Gaulle says it has been bred from *Plusia gamma*. This is probably the "*Sagaritis annulipes*, Tschek," found by Bridgman in June at Brundall in Norfolk; in any case the species is not uncommon with us, in fact it is probably the most generally met with; Surrey (Capron), Herts (Piffard), Devonport in May and bred from its rough and pale brown cocoon in November (de la Garde), West Runton in Norfolk, August, 1900 (Wainwright). It has usually occurred to me on *Angelica sylvestris* flowers in marshy places; Henstead near Lowestoft towards the end of August, 1898; during June in Framlingham Castle moat and during August on flowers at Barton Mills in Suffolk, as well as at Brandon and Tuddenham Fen in the same month.

CYMODUSA, Holmgren.

Holmgr. Sv. Ak. Handl. 1858, p. 39; Ofv. 1858, p. 324.

Head rarely buccate behind the finely pilose and internally but slightly emarginate eyes; clypeus somewhat convex, laterally foveolate, apically rounded and basally not or indistinctly discreted; mandibular teeth of subequal length; cheeks subbuccate with their costa inflexed; face of ♀ strongly constricted towards the apex. Thorax longer than high; meta-thorax with nearly complete and weakly carinate areae, and circular spiracles. Abdomen of ♀ apically subcompressed, of both sexes much longer than head and thorax and subcylindrical; petiole with neither lateral sulci nor scrobes, twice longer and a little narrower than the discally subdeplanate postpetiole; ventral plica of basal segment hardly shorter than that of second; terebra and in both sexes the seventh segment exerted, with former hardly longer than basal segment. Legs normal, slender and not short. Wings not broad; areolet regular and petiolate, emitting the vertical and broadly fenestrate recurrent nervure from its centre; discoidal cell apically rectangular below; stigma narrow; radial cell not elongate, with apical radial abscissa but slightly curved; nervellus geniculate.

Superficially the genus may be recognised by the exactly continuous basal nervure, the uniform length of the straight terebra which is about that of the basal segment, the hind tibiae never white, nor conspicuously black-marked, the cylindrical form with the elongate and often red-

banded abdomen, and the slender antennae with ♀ flagellum occasionally basally white. "The eyes being clothed with short stiff pubescence" is the fundamental character of the genus, and this is always easy of observation, *i.e.*, if not at once seen it is probably absent. I consider it improbable that these insects are Lepidopterous parasites.

Table of Species.

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|------|----|--|------------------------|
| (6). | 1. | Centre of abdomen with two or three red bands. | |
| (5). | 2. | Tegulae black; hind wing radial abscissa as long as first recurrent nervure. | |
| (4). | 3. | Flagellum of ♀ not white; ♂ metanotal costulae distinct | 1. CRUENTATA, Grav. |
| (3). | 4. | Flagellum of ♀ basally white; ♂ costulae obsolete | 2. LEUCOCERA, Holmgr. |
| (2). | 5. | Tegulae white; hind wing abscissa shorter than recurrent | 3. EXILIS, Holmgr. |
| (1). | 6. | Centre of abdomen not banded; tegulae clear stramineous | 4. ANTENNATOR, Holmgr. |

1. *cruentata*, Grav.

Campoplex cruentatus, Gr. I.E. iii. 575, ♀. *Porizon marginellus*, Zett. I.L. 395, ♀. *Cymodusa cruentata*, Holmgr. Sv. Ak. Handl. 1858, p. 40; Brisch. Schr. Nat. Ges. Danz. 1880, p. 144; Thoms. O.E. xi. 1096, ♂ ♀.

A black species with the tegulae concolorous, all the tibiae entirely red and the centre of the abdomen with three red trans-fasciae. Length, 5-6 mm.

Known from all the other species by its black tegulae and antennae, the concolorous mandibles with their centre pale, the entirely red femora and tibiae, and somewhat determinate metanotal areola and costulae. Of species with black tegulae this is the only one whose female has immaculate flagellum; the male is extremely like that of the next species, from which both sexes are best distinguished by the immaculate red hind tibiae, but it is said by Thomson to have the areola and its costulae more distinct.

North and central Europe, rarer than the next species; Lapland, Sweden in July, France, Breslau and Prussia. It has long been known as British, though it must be extremely rare with us for I have but a couple of females in Dr. Capron's Surrey collection, with one captured by Edward Saunders at Deal in May, 1872; and Bignell is said by Bridg-Fitch (Entom. 1885, p. 101) to have bred it from *Anisopteryx aescularia*, as the former tells us on 8th July in Devon. Of males I have captured a couple about Ipswich on reeds and mountain ash in June and as early as 10th April, and taken the female on *Heracleum* flowers during early August in Bentley Woods.

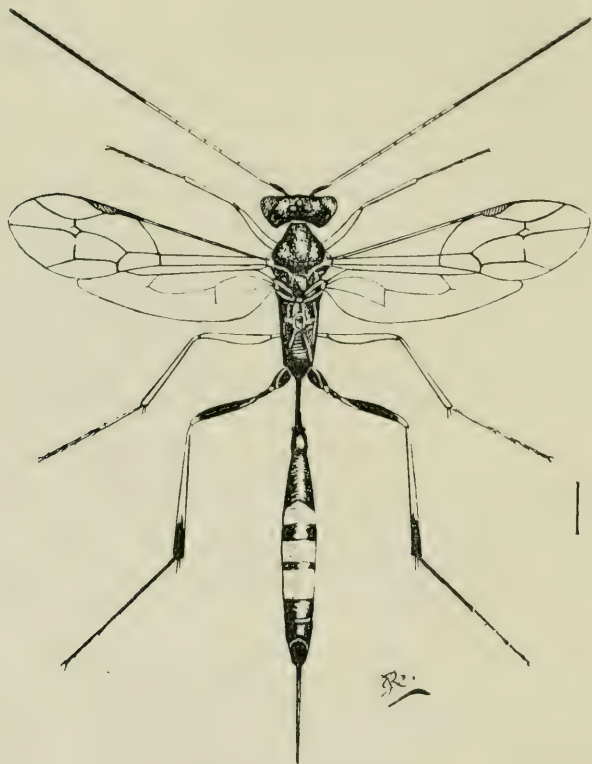
2. *leucocera*, Holmgr.

Cymodusa leucocera, Holmgr. Ofv. 1858, p. 325; Sv. Ak. Handl. 1858, p. 40; Brischke, Schr. Nat. Ges. Danz. 1880, p. 144; Thoms. O.E. xi. 1096, ♂ ♀.

A black species with the tegulae concolorous, tibiae red with the hind ones always apically and often basally infusate, centre of abdomen with

three red trans-fasciae and the ♀ flagellum basally pure white. Length, 5-7 mm.

Similar to the preceding, but the female is instantly known by the white-marked antennae; the male is difficult to distinguish; Thomson says the metanotal costulae are hardly distinct though the base and apex of its hind tibiae are black, while Schm. considers the areolar shorter. The hind femora appear much more frequently black here than abroad, and Capron had placed this form as a different species in his collection, but I trace nothing but this darker colouration which is co-existent with



more narrowly pale ♀ flagellum, since in the typical form the six to ten basal joints are laterally pale and with black femora only the five basal, or in one case second to fourth, joints are internally pale; the male rarely has the hind femora red with us.

Usually not uncommon on the Continent and said to there occur on short meadow grass. I find no mention of its late appearance abroad; with us it is never seen till the beginning of September and is on the wing till near the middle of October; it is our commonest species, extending to the highlands of Scotland. Mousehold and Eaton near Norwich in October (Bridgman), Oreston Quarry in Devon on 20th September (Bignell); Shere commonly (Capron), Box Hill at the end of

September (Beaumont); a female at Bungay on 3rd October, 1900 (Tuck) and three others at Abinger Hammer, Surrey, early in September (Butler); Oulton Broad at end of September (Bedwell), Felden in Herts (Piffard), Barnby Broad in Suffolk at end of September, 1900, and Banchory in Kincardine in September, 1910 (Elliott). I have taken it in Suffolk on 9th September in Henham Park; on 22nd in Bentley Woods; on 25th, 1907, many males by sweeping reeds in marshes at Depden, Barton Mills, Mildenhall and Chippenham Fen, and on that date five years earlier it it was flying not uncommonly among marsh grasses at Foxhall; on 26th in my Monk Soham garden; on 1st October, 1900, it was flying about yarrow at Benacre Park and on 7th I took a male on *Angelica sylvestris* flowers at Claydon Bridge in 1899. The insect termed *Callidora albovincla* by Marshall (Ent. Ann. 1874, p. 143), who took it at Braemar, is a typical female of the present species and is in the British Museum.

3. *exilis*, Holmgr.

Cymodusa exilis, Holmgr. Sv. Ak. Handl. 1858, p. 41; Brisch. Schr. Nat. Ges. Danz. 1880, p. 144; Thoms. O.E. xi. 1097, ♂ ♀.

A black and slender species with the tegulae white, the centre of the abdomen with at most two trans-fasciae and most of the legs red. Length, 4 mm.

Similar to the preceding and allied in facies but with the body smaller, the tegulae pure white and the anterior legs basally darker.

It is rare on the Continent; Holmgren knew a Swedish female taken at the end of July, a male from southern Lapland in the middle of August, etc.; Gaulle records it from France and Brischke doubtfully from Prussia. It has not hitherto been known as British; I possess a single pair, of which the female turned up on *Horæum sphondylium* flowers at Oxshott in Surrey, when I was collecting with Beaumont, on 10th July, 1901, and the male on 17th August, 1903, in a Ryde greenhouse.

4. *antennator*, Holmgr.

Cymodusa Antennator, Holmgr. Sv. Ak. Handl. 1858, p. 41; Thoms. O.E. xi. 1097, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 144, ♀. Var. *C. flavipes*, Brisch. loc. cit. p. 144; Bridg.-Fitch, Entom. 1885, p. 100, ♂.

A black species, with the tegulae flavescent white; the abdomen laterally towards its apex but not centrally rufescent, or in ♂ entirely black; the spiracles of the second segment beyond its centre; and the legs mainly rufescent, with anterior coxae and trochanters flavidous white. Length, 5-7 mm.

Easily known by the pale colour of the anterior legs and apically strongly constricted ♀ face.

Cymodusa flavipes is erroneously said by Schm. (Opusc. Ichn.) to certainly not belong to the present genus; in my long series the eyes are obviously, though sparsely, pilose. Bridgman discusses (Trans. Ent. Soc. 1887, p. 367) the probability of *C. flavipes* being a male form of Holmgren's species; unlike him, I possess typical males and find them to differ in nothing but colour, more especially in their piceous, nigrescent or black hind femora.

Not common in north and central Europe, nor in Swedish woods in July; Prussia, France, etc. Dr. Capron used to take the female and variety male commonly at Shere in Surrey and suggested their synonymy, but found no typical males; I have beaten the female from birch in Bentley Woods in the middle of July, swept it in Tuddenham Fen in August and found it on fennel flowers at Alderton early in September, and taken the typical male—which Marshall also gave me from Bishops Teignton—on *Angelica sylvestris* flowers at Foxhall on 17th September. The var. *flavipes* was described from Prussia and is much commoner than either typical sex with us; Bridgman considered it “to be generally distributed in England. I have taken it at Wimbledon; Dr. Capron takes it in the neighbourhood of Guildford; and I have also received it from Mr. Fitch. They have all been males, and I have seen no female which was at all likely to belong to it” (Trans. Ent. Soc. 1882, p. 149); several at Banchory in September, 1910 (Elliott), Greenings in June and July (W. Saunders), Chobham in the middle of July (Beaumont) and Brockenhurst (Morice); I have found it on 14th July, 1908, in my Monk Soham garden and swept it in a rough field on 24th July, 1902, at Gosfield in Essex.

CASINARIA, *Holmgren*.

Holmgr. Sv. Ak. Handl. 1858, p. 48; Ofv. 1858, p. 325.

Head transverse, short and very narrow behind the eyes, triangular in front; clypeus not discreted, apically broadly rounded, submarginate and mutic; peristomium and mandibles small, the latter moderately broad, constricted apically, with their lower margin generally dilated and somewhat reflexed, and teeth of equal length; cheeks short, with their costa usually continuous; eyes oblong and nude, at their juxta-antennal orbits deeply and very distinctly emarginate. Antennae shorter than body, filiform and usually stout. Thorax gibbulous and anteriorly subvertical; metathorax declived throughout, produced beyond hind coxae, sometimes longitudinally impressed centrally, with the notal areae very incomplete or wanting. Abdomen strongly convex, claviform and broader before anus, apically subdepressed or but slightly compressed; basal segment with spiracles at its apical third, lateral sulci wanting and postpetiole not abruptly explanate; second with the large thyridii far from its base, and spiracles nearly at its apical third; terebra a little reflexed, not or but very slightly exerted beyond anus. Legs normal and usually a little slender, with unguiculi and the tarsal claws small, the latter pectinate towards their base. Stigma narrow, often emitting radius from its basal third; areolet always distinct, small, petiolate and nearly regular; basal nervure strongly oblique, sometimes continuous; discoidal cell apically acute below; nervellus simple or geniculate.

This genus is distinct in its clavate abdomen, small head with short and very transverse vertex, internally strongly emarginate eyes, and the structure of both abdomen and thorax, says its author; which Bridg.-Fitch reduce to “having the margin of the eyes against the antennae notched.” The legs show no uniformity of colouration, the antennae are never elongate nor slender, the thorax is always very stout and convex, the lower basal nervure is postfurcal or subcontinuous, the mesonotum dull with the scutellum large and coarsely sculptured, the black or at most centrally red abdomen is disproportionately elongate and nearly

always evenly explanate from base to immediately before its apex in both sexes which, with its usually broad postpetiole and never distinctly exerted terebra, lends it an aspect of its own.

The species appear nearly confined to south of the Thames; I have seen a single specimen from Yorkshire, and hardly any from Suffolk. Two kinds, *C. rufimana*, Gr., and *C. albipalpis*, Gr., both standing under the broad genus *Limneria* in our last Catalogue of 1872, are now known to belong to this genus, but both have almost certainly been erroneously recorded as British; the first was introduced by Desvignes in 1856, occurs in southern Europe extending north only to the Tyrol, and has been bred by Gaulle from *Satyrus statilius*; the second was included in Marshall's 1870 Catalogus and occurs rarely on dry mountain sides from Austria, through Germany, to near Paris; neither is known in Scandinavia nor Belgium.

Thomson says "This genus is nearest to *Charops* and differs from the other *Limneriæ* both in the more evidently emarginate eyes, the neuration of the wings and in the shape of the abdomen, and the position of the spiracles. Most species are found in sandy meadows."

Table of Species.

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|-------|-----|---|--------------------------|
| (2). | 1. | Metathoracic spiracles elongate;
hind tibiae mainly pale | 1. VIDUA, Grav. |
| (1). | 2. | Metathoracic spiracles circular;
hind tibiae not mainly stramineous. | |
| (12). | 3. | Third segment transverse; postpetiole distinct and subglobose. | |
| (5). | 4. | Frontal orbits broadly and conspicuously flavous | 2. ORBITALIS, Grav. |
| (4). | 5. | All the orbits immaculate black. | |
| (9). | 6. | Nervellus intercepted far below centre; abdomen black. | |
| (8). | 7. | Anterior trochanters and tegulae pale; hind legs not all black .. | 3. MORIONELLA, Holmgr. |
| (7). | 8. | Anterior trochanters, hind legs and ♀ tegulae black | 4. PALLIDIPES, Brisch. |
| (6). | 9. | Nervellus not or centrally intercepted; abdomen partly red. | |
| (11). | 10. | Apical no longer than basal radial abscissa; tibiae not white .. | 5. CLAVIVENTRIS, Holmgr. |
| (10). | 11. | Apical much longer than basal abscissa; tibiae basally white .. | 6. MOESTA, Grav. |
| (3). | 12. | Third segment elongate; postpetiole not basally dilated | 7. ISCHNOGASTER, Thoms. |

1. vidua, Grav.

Campoplex viduus, Gr. I.E. iii. 197, ♂; Holmgr. Bih. Sv. Ak. Handl. 1872, p. 84, ♀; Thoms. O.E. xi. 1089, ♂ ♀. *C. Henaultii*, Desv. Cat. 98, ♀. *Casinaria vidua*, Holmgr. Sv. Ak. Handl. 1858, p. 51; Tschek, Verh. z.-b. Ges. 1871, p. 58, ♀. *Limneria vidua*, Brisch. Schr. Nat. Ges. Danz. 1890, p. 66, ♂.

A black species with only the anterior femora and tibiae flavescent fulvous, the hind tibiae centrally very broadly pale stramineous, and the metathoracic spiracles elongate-oval. Length, 6-10 mm.

This species is a little incongruous in whatever genus it be treated in its very small and elongate-oval metapleural spiracles, which are by no means linear, as in *Campoplex*, at the end of which Thomson places it on the characters of its totally black body clothed with sparse and sub-rigid pubescence, and to which Holmgren later restored it on the spiracular structure, which Tschek, while allowing it in *Casinaria*, describes as kurz-spaltformig and Bridg.-Fitch as "not circular." Schmeideknecht has recently transferred it to the genus *Trophocampa*, also with circular spiracles, because the abdomen is apically less clavate than in the remaining species of this genus.



It seems by no means abundant in north and central Europe; Belgium, France, Sweden; "usually found in shady places in woods" (Schm.); Gravenhorst knew but a single Berlin male. Bred from *Abraxus grossulariata* by Raynor (Entom. 1884, p. 67) and on 20th June by Bignell (*l.c.* 1881, p. 140), at Laira in Devon; the cocoon is "of an oval shape, and has the appearance of coarse brown paper, the apices brown, followed by a blackish zone; the central portion, which occupies one-third, is brown" (Bignell, *l.c.* 1880, p. 246; *cf. l.c.* 1884, pl. ii, fig. 11), the two irregular black bands being more or less obscured by a dense and testaceous woolly outer covering. Taken at Oxford by Hamm on 6th June and bred at Bristol by Charbonnier from larvae of *A. grossulariata*. Captured by Capron at Shere and once as late as 15th September by Piffard at Felden. In my experience this is exclusively an urban insect, frequently

bred from the above garden pest, but never taken in the open country; all my specimens, curiously enough, are from the London district, thus: bred near London by Clarke, from the above host at Tottenham on 21st June by C. T. Gimingham; at Brondesbury by Stanley Kemp; at Blackheath on 2nd July, by Beaumont; at Mickleham in June by Beathe; at Highgate, where he found it "very common," by Blair on 26th June; at Chiswick on 12th June by Sich; and several empty cocoons were noted by me on 16th April, 1890, on gooseberry bushes in the garden of Astley Bank, Lewisham Hill, along with young larvae of the Currant Moth. This restriction is the more remarkable in view of its host's ubiquity throughout the country; at Ipswich and Monk Soham the latter is abundant, but the parasite entirely absent.

2. *orbitalis*, Grav.

Campoplex orbitalis, Gr. I.E. iii. 510, ♀. *Casinaria orbitalis*, Holmgr. Sv. Ak. Handl. 1858, p. 48; Tschek, Verh. z.-b. Ges. 1871, p. 54; Brisch. Schr. Nat. Ges. Danz, 1880, p. 147; Thoms. O.E. xi. 1098, ♂ ♀.

A black species with the frontal orbits and tegulae white, femora fulvous, tibiae flavidous stramineous with the hind ones and base of their tarsal joints white. Length, 6-9 mm.

The only species with the internal orbits white. The genal costa is subinflexed, the mandibles and lower external orbits often flavous, lower angle of discoidal cell not strongly acute below, the radius emitted almost from basal third of stigma, the nervellus suboblique and nearly postfurcal; the scape pale beneath, basal nervure oblique, radius a little longer apically than basally; the calcaria large and, with both extremities of the hind tibiae, apically black.

North and central Europe, Belgium in July, France and from end of July to end of August in Sweden; Dr. Chapman has given me many specimens which I named and he recorded from Piedrahita in Spain (Trans. Ent. Soc. 1902, p. 728), where it was a very abundant parasite of *Heterogynis paradoxa*, along with and sometimes itself destroyed by *Pimpla alternans* (cf. Ichm. Brit. iii. 100); two only of the males there bred are referable to the var. *albosculellaris*, Thoms., proving the latter's synonymy with the type form, which alone occurs in Britain. One at Guildford in the summer of 1879 (Capron, Entom. 1880, p. 88, in coll. Morl.); bred from *Zygacna trifolii* Fitch, l.c. p. 18; ascribed, doubtless in error, to *C. vidua* at l.c. 1881, p. 140; from *Abraaxas grossulariata* by Weston (l.c. 1881, p. 140); taken by Norgate at Brundall and Sparham in Norfolk and bred by Fletcher from *Zygacna trifolii* (Bridg.). Abroad it is said to have been raised from young larvae of *Deilephila galii* and from larvae of *Anticlea sinuata*; cocoon elliptic, rough, whitish and more or less black-spotted at both ends (Brischke); my cocoons are 9 mm. in length, very woolly, with but indistinct dark bands on either side of their centre. I have seen a couple bred by Hamm at Shotover near Oxford in July, 1900, from *Zygacna loniceræ*; a male from the same host by Charbonnier at Bristol; four from Oxford *Z. trifolii* in 1905, by Cockayne; and a male emerged to Prof. Image on 15th July, 1908, from *Z. filipendulæ* at Portcynon near Zower in south Wales.

3. *morionella*, *Holmgr.*

Casinaria morionella, Holmgr. Sv. Ak. Handl. 1858, p. 48; Brisch. Schr. Nat. Ges. Danz. 1880, p. 147; Thoms. O.E. xi. 1099, ♂ ♀.

A black species with the mouth and tegulae white, legs red with coxae and whole of hind trochanters black, their tibiae infusate at both extremities. Length, 6—7 mm.

Distinctly smaller than *C. orbitalis* with the lateral carinae of the areola and petiolar areae continuous and confluent, antennae short and stout with their apical joints transverse and scape often pale beneath, the abdomen and apical radial abscissa longer, the nervellus nearly ante-furcal, geniculate far below centre, and the hind tarsi white only at their extreme base.

Rare, but widely distributed (Thomson). Sparsely scattered through northern Europe; Belgium in June, France, Sweden in July and early August. Bred from larvae of *Acidalia trilinearia*, *Antichia sinuata* and *Eupithecia absynthiata* and by Mrs. Holmes at Sevenoaks on 11th July; the cocoon is elliptic and brown with a central flavidous zone (Brischke). This species was introduced as British by Bridgman (Trans. Ent. Soc. 1889, p. 421) on the strength of two specimens bred by Fletcher from *Eupithecia expallidata*, taken in the Abbott's Wood in Sussex. It is rare with us and apparently a southern species, since I have taken but a single pair, at Lyndhurst and Matley Bog in the New Forest early in August, 1901; in Norton Wood in the Isle of Wight on 20th June, 1907; and a female in the middle of the latter month in the Bentley Woods near Ipswich. Lyle has bred it from its cocoon, which he beat out of a furze bush in the New Forest; and Colonel Nurse raised both sexes on 13th May, 1911, from *Eupithecia dodoneata* at Timworth in Suffolk.

4. *pallidipes*, *Brisch.*

Casinaria pallipes, Brisch. Schr. Nat. Ges. Danz. 1880, p. 148; Schm. Opusc. Ich. 1627, ♂ ♀.

A black species with the mouth and ♂ tegulae white, legs black with only the front femora fulvous, and hind tibiae obscurely testaceous at base and centre. Length, 6—7 mm.

Extremely like *C. morionella* but differing, besides its very much darker legs and anterior trochanters, in having the nervellus not at all geniculate, the ♀ tegulae dead black, the areolet larger and abdomen broader. Brischke says his description applies to both sexes, but in my females the tegulae are not at all pale, and the scape is immaculate, nor are the anterior coxae fulvous beneath, all of which details seem to apply to the male.

This species has not been met with on the Continent since first described from Prussian specimens bred out of *Nemorea aestivaria* larvae; their cocoon is said to be elliptic and roundish, wrinkled and white, with a broad and irregular subapical zone of black at either end. I was so fortunate as to capture a couple of females of this rare species on 10th July, 1909, in a Lyndhurst garden in the New Forest. Taken at Poyntz-pass in Armagh in early June by the Rev. W. F. Johnson.

5. *claviventris*, Holmgr.

Casinaria claviventris, Holmgr. Sv. Ak. Handl. 1858, p. 49; Thoms. O.E. xi. 1099, ♂ ♀.

Black with the centre of abdomen broadly, femora and tibiae red, with the latter apically black though not white-marked in the hind pair. Length, 6–8 mm.

The centrally intercepted nervellus, the straight apical radial abscissa hardly longer than the basal, irregular areolet, continuous basal nervure, black mandibles and tegulae render this a conspicuous species.

It was thought to be not uncommon in central and northern Europe by Thomson and is recorded from Sweden, France and Belgium in July. With us, however, it would seem extremely rare, and was first discovered as British by Bridgman (Trans. Ent. Soc. 1889, p. 421), when Porritt bred both sexes out of *Scodiona belgiaria*. It was not subsequently noticed till the 28th August, 1905, when a single male occurred to me on the flowers of *Angelica sylvestris*, growing on the banks of the Lark River at Barton Mills; and on 16th September, 1912, I took the female at Rumburgh in northern Suffolk.

6. *moesta*, Grav.

Campoplex moestus, Gr. I.E. iii. 599, ♂. *Casinaria moesta*, Woldst. Bull. Acad. Sc. Petersb. 1876, p. 391, ♂; Thoms. O.E. xi. 1100, ♂ ♀. *Limneria moesta*, Bridg.-Fitch, Entom. 1885, p. 207, ♂.

A black species with the abdomen centrally red, all the tibiae basally pure white and the front ones stramineous. Length, 6–8 mm.

Our only species with the abdomen broadly red and tibiae white-marked, easily recognised by the elongate apical radial abscissa and basally curved basal one, the long and stout antennae, red third to fifth segments with apex of second usually concolorous; the posterior tibiae are not red-marked and the second segment is nearly double length of the transverse third.

It extends to southern Europe, but is always rare; Giraud bred it in France from *Noctuella sp.* in 1877, and Bridgman tells us (Trans. Ent. Soc. 1881, p. 158) that Bignell has raised three males from the common *Hybernia progemma* and *H. defoliaria*. I have two taken at Shere by Capron and a female found at York on 28th June by Beaumont, all bred out of their hard, dull, ochreous cocoons with black bands on either side of the central pale zone; Tonge has given me a Surrey female, captured in 1910; and Lyle has beaten the cocoon from blackthorn in the New Forest and bred it from so different a host as *Bombyx neustria* there.

7. *ischnogaster*, Thoms.

Campoplex tenuiventris, var. 1, Gr. I.E. iii. 482, ♂ ♀; Holmgr. Sv. Ak. Handl. 1854, ♀ (*nec* Gr. typ.). *Casinaria tenuiventris*, Holmgr. *lib. cit.* 1858, p. 49; Ofv. 1858, p. 325, ♂. *C. mesozosta*, Holmgr. Sv. Ak. Handl. 1858, p. 50, ♂ (*nec* Gr.). *C. ischnogaster*, Thoms. O.E. xi. 1101, ♂ ♀.

Black with the tegulae and mandibles pale stramineous, the femora and tibiae red, the hind tibiae bifuscos and basally whitish. Length, $7\frac{1}{2}$ –9 mm.

All the British records are given under the name *C. tenuiventris*, Grav.,

the type form of which Thomson found to be specifically distinct from the first variety, which is the form described by Holmgren and differs primarily in having pale and not black mandibles and tegulae; since I have seen none from Britain with infusate mouth or tegulae I have excluded *C. tenuiventris* from our fauna and substituted Thomson's species, which agrees with Gravenhorst's in the pedal colouration and apically hardly dilated abdomen, though with both mouth and tegulae pale, apical radial abscissa longer, nervellus vertical and not geniculate, mesopleurae subcoriaceous, trochanters and hind trochanterellus flavidous, varying occasionally in having the second to fourth segments basally rufescent on either side or with more or less interrupted red fasciae and (var. *mesozosta*, Hlg.) the scape pale beneath.

This is by far our commonest species of the genus, though by no means abundant; on the Continent it is widely distributed through France, Germany, Bruxelles in July, and Sweden in both July and August. I possess several from Shere (Capron), Tostock in Suffolk on 17th September, 1898 (Tuck), Greenings in July (Saunders), Govilon in south Wales (Marshall), Harting in Sussex, September (Beaumont); it has been bred at Dorking from *Hypona proboscidalis* on 27th May, 1901, by Prideaux, and in the New Forest from *Hemithea strigata* in 1905 by Blair, as well as from uncertain hosts in Hampshire by Gorham; in West Kent during May from larvae of *Cucullia gnaphalii* by Mrs. Holmes; and on 8th August, 1902, Dr. Chapman sent me a female bred from *Pionia interstitialis* at Bejar in Spain. It has occurred to me sparingly in the Devil's Ditch near Swaffham Prior in Cambs on 10th June, 1902, in a Ryde garden in September and (dead) in October, and at Setley in the New Forest on 12th July.

Probably the specimens of *C. tenuiventris* bred by Bignell on 26th May, and by Butler from *Hemithea thymiararia* (Entom. 1881, p. 140), and by the former in Devon from *H. progemma* on 2nd July (Entom. 1885, p. 104), belong here; though those from *Ephyria punctaria* (Giraud, 1877), *Amphydasis betularia* (Gravenhorst), *Pieris rapae* (DT.) and that of the synonymous *Campoplex conicus* from *Bombyx dispar* (Ratz. i. 95), should be referred to Gravenhorst's species, which Thomson also calls *C. latifrons*, Holmgr. On 27th May, 1910, I found a cocoon on a hawthorn leaf in my Monk's Soham garden from which a female emerged early in the following month and was dead on 23rd.

LIMNERIUM, Ashmead.

Ashm. Canad. Entom. 1900, p. 368; *Limneria*, Holmgr. Ofv. 1858, p. 326 (part.), (nec Adams); Thoms. O.E. xi. 1103; *Eulimneria*, Schm. Hym. Mittel-europ. 1907, 600.

Head very little narrowed behind the eyes, with vertex somewhat broad; frons with a central longitudinal carina beyond the apical ocellus; cheeks not short, usually subconstricted, with their costa nearly continuous and slightly inflexed; mandibles not elongate, somewhat stout and but little narrowed apically, with the lower margin subreflexed near its base. Antennae somewhat stout and apically attenuate, with scape entirely black. Thorax gibbous; pronotal angles usually striolate, meso-sternum subtransverse; metathorax with petiolar area broadly excavate, the dentiparal areae narrow and rarely entire; areola transverse, with its basal area very short, transverse or quadrate. Abdomen broad and

immaculate black; basal segment with petiole broad and its lateral sulci sometimes deeply impressed; postpetiole broad with no lateral scrobes, but sometimes a fine impressed line extending from its apex to spiracles; seventh segment incised, though rarely emarginate; terebra stout, curved, hardly as long as half the abdomen. Legs somewhat stout, with the coxae not pale; basal hind tarsal joint nearly always white-banded; claws pectinate at least towards their base. Wings with the lower basal nervure not oblique; areolet somewhat large, not sessile, generally subregular and emitting the hardly or but slightly oblique recurrent nervure from its centre; radial cell not broad, with its basal and apical abscissae nearly equally curved; apical angle of the discoidal cell not or hardly acute below; nervellus neither oblique nor geniculate.

This is known from all other Campoplegid genera by having the metathoracic spiracles circular, the clypeus apically mutic, the eyes glabrous and not internally distinctly emarginate, with the petiolar area centrally broadly excavate and the nervellus neither oblique nor geniculate. Only *Omorgus* has an equally deeply impressed petiolar area, and in that genus the nervellus is both oblique and geniculate, with the postpetiole much more convex and laterally rounded; as in *Canidiella*, the lower basal nervure is here distinctly a little inflexed at its lower extremity.

All the remaining genera of the Campoplegides (for *Angitia* is hardly now used in its original sense), except the next one, were grouped under the comprehensive genus *Limneria* by Holmgren in 1858 and comprised all the smaller *Campoplex*-species of Gravenhorst: to a bewildering number, as will be seen in the synonymic index. Of this broad genus *Limneria*, Marshall enumerated seventy-three species as British in 1872 and Bridg.-Fitch tabulated (for the most part upon colour distinctions) one hundred and eight in 1885, at which date nearly fifty were known in the female and four or five in the male sex only. Great progress is noticeable since that time and we now have stable characters by which to divide them up into less unwieldy groups; this we owe almost entirely to the very excellent system of Prof. Thomson, who did not adopt the impossible and typeless genera sketched by Förster in 1868, but often erected genera with so similar, though always different, a name that one is enabled to distinguish which group he thought might perhaps represent Förster's title. Little has been added to this revolution in our knowledge since 1887, and the smaller Campoplegides are admittedly among the most difficult groups of the Ichneumonidae.

Great care has been necessary to assign our hundred *Limneriae* to their correct modern genera, but I find at length there are still half-a-dozen outstanding, which have defied all my efforts to relegate to any satisfactory position. These are, consequently, practically useless names; I can do no more than present the descriptions of authors and place them under the present genus as that nowadays typifying, though in so very restricted a form, the old *Limneria* of Holmgren; no more can be done towards their elucidation till the type specimens be re-examined.

Table of Species.

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|------|----|---|----|----|----------------------|
| (8). | 1. | Basal area obsolete; hind tibiae black at apex and before base. | | | |
| (5). | 2. | Lateral petiolar sulci fine; hind tibiae centrally white. | | | |
| (4). | 3. | Larger; hind femora entirely red throughout | .. | .. | .. I. ALBIDUM, Gmel. |

- | | | | |
|------|----|--|------------------------------|
| (3). | 4. | Smaller; hind femora distinctly black at their apices | 2. GENICULATUM, <i>Grav.</i> |
| (2). | 5. | Lateral petiolar sulci deep; hind tibiae centrally rufescent. | |
| (7). | 6. | Hind femora distinctly black at their apices | 3. ANNULATOR, <i>Zett.</i> |
| (6). | 7. | Hind femora entirely red throughout | 4. RUFIFEMUR, <i>Thoms.</i> |
| (1). | 8. | Basal area quadrate; hind tibiae not at all black-marked | 5. XANTHOSTOMA, <i>Grav.</i> |

The remaining six species are temporarily placed here for convenience.

1. *albidum*, *Gmel.*

Ichneumon albidus, Gmel. S.N. i. 2705. *Campoplex albidus*, Gr. I.E. iii. 474, excl. varr.; Ratz. Ichn. d. Forst. i. 94, cf. iii. 84; Holmgr. Sv. Ak. Handl. 1854, p. 12; ♂ ♀. *Limneria albida*, Holmgr. *lib. cit.* 1858, p. 53; Brisch. Schr. Nat. Ges. Danz. 1880, p. 148; Thoms. O.E. xi. 1104, ♂ ♀.

A black species with the femora and tibiae red, the hind tibiae pure white with their apices broadly black and a nigrescent band before their base. Length, 6–10 mm.



The typical form of Thomson's rendering is large and not less than nine mm. with the postpetiole and second segment not transverse, the mesopleurae somewhat closely punctate, the metathorax not trans-rugose but closely punctate with stout costulae and the inner area subcomplete,

the hind trochanterellus with anterior trochanters are red or in male flavous; our form appears to more usually coincide with the var. *juni-perinum*, Holmgr., the male of which is very distinct in having the third and fourth segments pale-banded, the only pale marks known on the abdomen of the present genus and this variety is said by Schmiedeknecht to be the most prevalent Continental form though I cannot consider it specifically distinct. The present is at once known from our other species by the centrally white hind tibiae and pure red hind femora.

L. albidum is recorded abroad in every month from May to September on umbels, etc.; Italy, Germany, France, Hungary, Lapland, and not uncommon in Sweden and Belgium. It has been raised from *Tortrix Buoliana* by Hartig (Jahresb. 268) and by Bernuth in September (Ratz. iii. 84); from *T. viridana*, *Eupithecia rectangularia* and the Hymenopterous genus *Rhynchium* (Giraud, 1877). In Britain it is recorded from *Gonepteryx rhamni* (Entom. 1880, p. 68; but cf. *Anilasta placida*, Desv., post); *Eupithecia absynthiata* by Atmore (Bridg.); and taken by the former at Kings Lynn in 1906. Bridgman says it is common in Norfolk, and I possess a good many specimens of both sexes, though only one male with pale abdominal bands, with three females, in Capron's Surrey collection; Tuck took it at Tostock in the autumn of 1898 and in July, 1899; Charbonnier at Redland near Bristol in September; Bouskell found it at Rossbeigh in Co. Kerry in June, 1902; and to this species is referable the female I mentioned (Ichn. Brit. iii. 106) "like *Omorga cursitans*," as bred by Bankes with four female *Pimpla alternans* in May, 1905, from *Clepsis rusticana*, Tr., in the Isle of Purbeck. It has occurred to me sparingly on flowers of *Daucus carota* in Tuddenham Fen at the end of August, at Bealings at the end of July, in Monk Park Wood, on reeds in the Southwold salt-marshes early in August, and at Monk's Soham hovering at whitethorn in May and on Angelica flowers in August. Miss Chawner has given me a female bred at Burley in the New Forest from *Hypomomeula padella* during July; and I took males at Market Rasen in Lincs in 1912 so early as 11th June.

2. *geniculatum*, Grav.

Campoplex geniculatus, Gr. I.E. iii. 486, excl. varr.; Ratz. Ichn. d. Forst. iii. 84, ♂ ♀. *Limneria geniculata*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 148, ♂ ♀; Thoms. O.E. xi. 1105, ♀.

Black with the femora and tibiae red, the hind femora apically and their tibiae both before the base and broadly at the apex nigrescent. Length, 6 mm.

Known from the remainder of our species, except the next one, by the apically black hind femora and from the last also by the more finely sculptured mesopleurae. It was much mixed with the next species, to which most of the following details probably apply, till Thomson regarded them as distinct in 1887.

France, Italy, Germany, Sweden and during March, May, June and August in Belgium; bred by Reissig from *Rhodophaea suazella* (Ratz. loc. cit.) and from larvae of *Pionia forficaris*, *Eupithecia succenturiata* and from an *Acronycta* larva by Brischke, who says the cocoon is elliptic and flavidous brown. With us it has been taken at King's Lynn by Atmore, (Bridg.) and at Bickleigh in Devon on 24th June (Bignell); bred from *Phycis betulella* by Fitch and Bartlett (Entom. 1883, p. 66) and from

Depressaria heracliana by Elisha (*l.c.* 1884, p. 67). It is apparently rare with us; Elliott captured a male at Dover on 2nd September, 1901, and Banks bred two more on "May 13th and 17th, 1904, from pupae of *Clepsis rusticana*, Tr., collected in Isle of Purbeck, Dorset, on 10th May, 1904"; the latter are probably co-specific with the last species in spite of their distinctly black knees.

3. *annulator*, Zett.

Porizon annulator, Zett. Ins. Lap. 1838, 394, excl. ♀. *Limneria geniculata*, Holmgr. Sv. Ak. Handl. 1858, p. 54, ♂ ♀ (*nec* Grav.). *L. planiscapus*, Thoms. O.E. xi. 1105, ♂ ♀.

A black species with the femora and tibiae fulvous, the hind femora and tibiae apically black, their tibiae centrally not white but nigrescent before the base. Length, 6 mm.

Very like *L. geniculatum* in colour, size and conformation, but with the hind tibiae centrally red, the petiole shorter and broader, postpetiole subdeplanate, with the petiolar sulci deeply impressed from the base nearly to the spiracles, and the lateral postpetiolar lines entire, the vertex angularly emarginate and the second ♀ segment subtransverse.

Not uncommon, especially in marshy meadows, in Lapland and Sweden, extending to central Europe; France, and during July and August in Belgium. It has hitherto been mixed with the last species in Britain too inextricably to allow of division, though many of the records there given doubtless refer to Holmgren's and not Gravenhorst's *geniculatus*. I possess a female from Capron's collection under Holmgren's name, another bred from "*Tortrix*" by Barrett and a single male, which I swept while collecting with the late Arthur Chitty on 5th May, 1907, at Icklingham in Suffolk.

4. *rufifemur*, Thoms.

Limneria rufifemur, Thoms. O.E. xi. 1106, ♂ ♀.

A black species with the femora and tibiae fulvous, and the hind tibiae black at their apices and before base. Length, 6-7 mm.

To *L. annulator*, Zett., this species is allied in having the metanotal areola shining and somewhat smooth above, but the hind femora are not apically black and are proportionately less stout with the genal costa subinflexed, the basal segment less deplanate and the second a little longer.

It was described from Sweden and Thomson adds that Dr. Kriebaumer bred it from *Botys sericealis*, presumably in Germany. With us I find it by no means rare; Felden in Herts (Piffard); Lyndhurst in the New Forest, in August (Adams); Shere in Surrey (Capron). It has several times occurred to me on my house-windows, and on flowers of *Angelica sylvestris* at Monk Soham, in June and August; and on 4th July, 1900, I swept a male at Dunwich on the Suffolk coast.

5. *xanthostoma*, Grav.

Campoplex xanthostomus, Gr. I.E. iii. 460, ♂. *Limneria xanthostoma*, Thoms. O.E. xi. 1107, ♂ ♀.

Black, with the femora and tibiae red; the metathoracic carinae strong and the lateral ones complete; the mandibles flavous and tegulae white; and the ♂ anterior coxae pale beneath. Length, 7-8 mm.

This species is very distinct in its stout and elongate mandibles, which are but slightly constricted apically, whereas in all our others they are distinctly narrowed towards their apices and by no means elongate with their lower margin basally subreflexed; in the distinct and quadrate basal metanotal area; in the immaculate hind tibiae, which are red with a paler basal band; and in the elongate and hardly pectinate claws.

Gravenhorst received a couple of males from Etruria and Piedmont; and no one had subsequently noticed the species till 1887, when Thomson pronounced it to be not uncommon in northern and central Europe. It is certainly rare with us; I have two females agreeing with the later description, which were bred on 21st and 24th September, 1907, from dug pupae—probably, but uncertainly, those of *Cidaria psittacata*—at Withycombe near Taunton; Barrett bred a female from "*Tortrix*"; and on 4th July, 1890, I took another flying with many of their owners about the burrows of *Colletes Daviesana*, Smith, in a sandy bank at the Bentley Woods near Ipswich.

deficiens, Grav.

Campoplex deficiens, Gr. I.E. iii. 474, ♀; *Limneria deficiens*, Bridg.-Fitch, Entom. 1885, p. 104, ♀.

Head with the palpi piceous. Abdomen subcompressed, with terebra hardly half its length and reflexed. Legs red, with all the coxae and trochanters black; posterior tarsi infusate, with their base red. Wings subhyaline, with stigma and radius infusate-piceous, radix and tegulae pale stramineous; areolet wanting. Length, $9\frac{1}{2}$ mm.

The above is the entire description of Gravenhorst, who remarks that this female is of the size and conformation of *Limnerium albidum*, though stouter, with no areolet and the pedal colouration distinct. He knew only a single Breslau female.

No further mention was made of the species till 1881, when Fitch records it, with a query, as having been bred by Clifton and Bignell from *Eupithecia pulchellata* (Entom. 1881, p. 140). This is explained by Bridgman, in introducing it as British (Trans. Ent. Soc. 1881, p. 161): "Mr. Bignell has bred a *Limneria* from *Eupithecia pulchellata*, which agrees better with Gravenhorst's description of this insect than any other I can find. It differs only in having the trochanters yellow, hind pair black at the base. These insects often vary in colouration; and as Gravenhorst described his species from a single insect this may be a variety of it. Length, $2\frac{1}{2}$ lin." Bignell does not record it from south Devon in 1898; though Marquand found it in Cornwall (Tr. Penz. Nat. Hist. Soc. 1883, p. 343).

Bridg.-Fitch differentiates it from the rest of the broad genus *Limneria* by the characters:—Abdomen, scape and coxae black; hind tibiae and femora entirely red; terebra fully half-length of abdomen, trochanters and stigma black; length, $9\frac{3}{4}$ –10 mm.

arvensis, Grav.

Campoplex arvensis, Gr. I.E. iii. 488, ♂; *Limneria arvensis*, Bridg.-Fitch, Entom. 1885, p. 106, ♂.

Head with the palpi, and usually centre of mandibles, testaceous. Thorax and the subcompressed abdomen immaculate black. Legs with

coxae black, the front ones sometimes testaceous beneath; trochanters black, the anterior sometimes beneath or apically fulvous or stramineous, the front ones more rarely entirely stramineous; femora fulvous or red, the intermediate usually externally infusate, the hind or posterior nigrescent or more usually red, or castaneous towards their apices; tibiae fulvous or testaceous-red, the hind ones apically black with a band before their base usually more or less nigrescent, the intermediate rarely infusate beneath; tarsi infusate with the anterior basally or entirely rufescent-fulvous. Wings more or less slightly clouded, with the stigma dark testaceous, the radix and tegulae stramineous or the latter piceous; areolet subregularly triangular, petiolate or subpetiolate. Length, 5-6 mm. ♂ only.

Gravenhorst says the size and coformation are similar to his *C. dispar* (? *Angitia annulicrus*, Thoms.), but the abdomen a little shorter and broader, with especially the basal two segments shorter and broader.

Bridg.-Fitch, who mark it with a query as though possessing something that might be referred to it, differentiate it from the rest of the broad genus *Limneria* by the characters:—Hind femora red, basally black; abdomen black; front coxae apically pale below; hind tibiae white, with apices and subbasal mark dark; metathorax not concave; areolet entire.

Gravenhorst here places examples from Germany, Silesia and, perhaps, Piedmont, one of which he took on umbelliferous flowers on 22nd May. Probably on the strength of the Piedmont example, Dours in 1874 and Gaulle in 1908, consider it to be French. Desvignes claims to have possessed it in his collection in 1856 and it has, consequently, figured in the subsequent British lists.

Paniscus, Grav.

Camptoplex Paniscus, Gr. I.E. iii. 498, ♂ ♀; Curt. Farm Ins. 1860 et 1883, p. 87; *Limneria Paniscus*, Bridg.-Fitch, Entom. 1885, p. 107, ♂ ♀.

Head with the palpi and mandibles stramineous. Antennae slender and filiform, of ♂ a little shorter than body, of ♀ a little longer than half body. Thorax gibbulous and black. Abdomen subcompressed, a little longer and narrower than head and thorax; basal segment of ♀ as in *C. arvensis*, of the ♂ much narrower and sublinear, with postpetiole but slightly broader than petiole and double as long as broad; terebra a fourth of the abdomen in length. Legs normal; coxae black, with the front ones of ♀ beneath entirely, of ♂ apically, testaceous; anterior trochanters pale flavous with a basal infusate mark above, the hind ones black and apically pale flavous; front femora of ♂ stramineous-fulvous and of ♀ red, the intermediate of ♂ stramineous and discally black, of ♀ red and discally darker with base and apex nigrescent, hind femora black; anterior tibiae stramineous with the intermediate of ♀ nigrescent below and dull stramineous apically black above, of ♂ fulvidous-stramineous and apically nigrescent; hind tibiae of ♂ testaceous and apically black, of ♀ black and centrally subinfusate; tarsi of ♀ black with only base of the front ones pale, of ♂ infusate with base of posterior ones paler and of front ones broadly testaceous. Wings hyaline with stigma piceous-stramineous, radix and tegulae pale stramineous; of ♂ normal with areolet subpetiolate, of ♀ shorter and narrower with areolet sessile. Length, ♂ $6\frac{1}{2}$, ♀ 6 mm.

Differs, says its author, from *C. dispar* and *C. arvensis* in the longer and less compressed abdomen; and the ♂—which appears probably a distinct species to me—agrees in the slender and narrow structure of the basal two segments with *Casinaria tenuiventris*, Grav. Curtis in 1860 gives an ultra-popular and quite useless description.

Bridg.-Fitch differentiate it from the rest of the broad genus *Limneria* by the characters:—Terebra one-fourth of abdomen, second ♀ segment not transverse, base and apex of hind tibiae dark, hind femora dark, abdomen black, metathorax hardly concave, areolet entire.

Gravenhorst only knew it from Austria; but Curtis considered “this insect is abundant in July and August, upon almost every umbelliferous plant in fields and hedges, feeding in the flowers, and searching for caterpillars for the purpose of depositing eggs in them”; Mr. J. Weaver of Petersfield in Hants sent him thence seventeen cocoons of *Cerostoma xylostella* (*Plutella cruciferarum*) from which emerged only five moths and twelve of the present species of parasite, which he quite certainly misidentified. His species was most probably *Angitia fenestralis*—cf. the same host, given by Giraud under *A. majalis*, post. Nor do I put the least faith in Fitch’s statement (Entom, 1881, p. 140) that the present species was raised from *Lithocolletes* by Sang.

alienatum, Grav.

Campoplex alienatus, Gr. I.E. iii. 620, ♂ ♀; *Limneria alienata*, Bridg.-Fitch, Entom. 1885, p. 105, ♂ ♀.

Head black. Antennae setaceous and longer than half body. Thorax black. Abdomen a little longer and a little narrower than head and thorax, dorsally fusiform with the third to seventh segments laterally compressed; anus of ♂ obtuse, of ♀ truncate; petiole and anus black; postpetiole smooth and subquadrate, a little broader than long and more than double the breadth of though a little shorter than the petiole, red and basally becoming black; second to fourth segment red, in ♂ sometimes apically black; terebra subexserted, with spicula red and apically subulate, and the clavate valvulae black. Legs red with the coxae and trochanters black; hind tarsi and tibiae nigrescent, with the latter ferrugineous towards their base. Wings infumate hyaline with the stigma and radius infusate, radix and tegulae pale stramineous; areolet wanting, or extremely incomplete, small and elongately petiolate. Length, 7–8½ mm.

Gravenhorst says this species has nearly the size and conformation of his equally little known *Campoplex nitens*, but with the areolet wanting, the antennae a little stouter, the postpetiole a little broader and the terebra much shorter.

Bridg.-Fitch differentiate it from the remainder of the broad genus *Limneria* by the characters: Abdomen black with its centre, the femora and tibiae red, with hind tibiae apically dark; terebra very short; scape not pale beneath; areolet wanting.

Bonelli sent Gravenhorst two males and a female from Piedmont. Giraud states (Ann. Soc. Fr. 1877, p. 403) that he bred it from *Melitaea trivia*, on the strength of which Gaulle in 1908 records it from France. Marshall in both his 1870 and 1872 catalogues includes it as British under the genus *Limneria*, which is all that is at present known of the species. Certainly I do not possess it.

monticolanum, Bridg.

Limneria monticolana, Bridg. Trans. Ent. Soc. 1881, p. 159, ♂ ♀; Bridg.-Fitch, Entom. 1885, p. 207.

Head buccate and not posteriorly constricted; face narrower apically, clypeus apically sinuate, cheeks nearly wanting, eyes internally entire; mandibles flavidous, apically black. Antennae three-quarters as long as body, black with the scape apically more or less broadly testaceous beneath. Thorax elongate, black; metanotal areae complete, costulae entire and areola elongate hexagonal. Abdomen black with apices of second and third segments distinctly, and sides of the following three often more or less, testaceous; postpetiole a third longer than broad, foveate between spiracles; second segment of ♂ a third longer than broad, of ♀ subquadrate; ♂ with third segment longer than broad and fourth subquadrate; terebra not exerted, venter pale. Legs deep fulvous with all the trochanters pale fulvous and the hind ones basally piceous-marked; anterior coxae basally piceous, hind ones entirely nigrescent; hind and base of intermediate femora mainly piceous, their tibiae apically and also sometimes basally infusate. Wings with areolet subsessile, emitting recurrent nervure immediately beyond its centre; nervellus not or not distinctly geniculate. Length, circa 5 mm.

Differentiated from the rest of the broad genus *Limneria* by Bridg.-Fitch on the characters:—Central segments red-margined, head much broader posteriorly than against the eyes, extreme base of hind tibiae dark, hind femora dark, abdomen broadly red, metathorax not concave. The indefinitely described nervellus precludes exact classification to this species, without an examination of the type. The colouring recalls that of certain *Phobocampae*, though the head seems similar to *Holocremina incrassata*, Holmgr.

Mr. J. Sang bred a female, with a couple of males, during the summer of 1880 from *Elachista monticola* in Britain (Bridg., *loc.cit.*; repeated at Entom. 1881, p. 140).

renominatum, *n.n.*

Limneria distincta, Bridg. Trans. Ent. Soc. 1887, p. 367, ♂ (*nec* Prov. 1882).

A black species with only the mouth, tegulae and part of legs pale. Head transverse, hardly constricted posteriorly and a little broader than thorax; face subquadrate and about as broad as frons; palpi and mandibles flavous. Antennae but slightly shorter than the body. Thorax longer than high; mesonotum reticulate with large, close and somewhat shallow punctures; metathorax longitudinally deeply sulcate and concave throughout, with areola longer than broad, apically incomplete and the costulae subobsolete. Abdomen slender and elongate, more than a third longer, though narrower, than head and thorax; basal segment longer than hind coxae and trochanters; petiole slender, about as long as but not half breadth of the longer than broad and subparallel-sided postpetiole; second segment a third longer than broad; third quadrate, and the three following segments of equal length and a third broader than long; sides and anus pubescent. Legs red with coxae and trochanters, and a central streak on intermediate femora, black; intermediate tibiae apically infusate; all the calcaria and base of the posterior tarsal joints

white; hind legs black with their tibiae, except at apex and before base, red. Stigma infusate, tegulae and radices flavous; areolet petiolate, emitting recurrent nervure at about its centre; apical radial abscissa almost straight; nervellus entire. Length, 6 mm. ♂ only.

This appeared to Bridgman "to be a very distinct and undescribed species; the colour of the hind legs is different from any other of this group." The pedal colouration certainly remarkable; but this insect seems to combine the excavate metathorax of *Omorga* with the entire nervellus of *Angitia*, and I cannot place it.

The type alone is still known; it was bred by Fletcher in July, 1886, from *Gelochia lentiginosella*, collected at Abbots Wood near Polegate in Sussex.

PYRACMON, Holmgr.

Holmgr. Sv. Ak. Handl. 1858, p. 101; Ofv. 1858, p. 326; *Ophiodes*, Htg. Ber. Naturw. Ver. Harz. 1847, col. 18 (*nec* Wag. 1828); *Ophiogastra*, Ashm. Canad. Entom. 1900, p. 368.

Head not very distinctly broader than thorax but strongly buccate and subcubical, with the very broad cheeks and the temples tumidous; eyes not large, and internally subentire; face transverse, and a little dilated towards the short and stout mandibles; clypeus laterally foveolate, basally not discreted, apically subtruncate or broadly rounded, immarginate and in our species centrally angled. Antennae filiform, not elongate, apically a little attenuate, with basal flagellar joints discreted. Thorax cylindrical and longer than high; pronotum not strigose, with epomia obsolete or wanting; metathorax not apically produced, with distinct areae and usually complete carinae; basal area oblong-quadrate, areola elongate and emitting costulae before its centre; spiracles circular or oblong. Abdomen elongate and normally broad, apically somewhat compressed; basal segment stout and but little curved, with the spiracles immediately behind its centre; postpetiole nearly twice as long as broad, and not much broader than the petiole; petiole not broader than high, with distinct lateral sulci; second segment not transverse, the seventh exserted; terebra somewhat elongately exserted, curved, with the spicula slender. Legs somewhat stout, with hind ones subelongate; femora incrassate, calcaria short; tarsal claws somewhat stout, obsoletely pectinate basally. Wings with the areolet large, usually sessile and broad, sometimes pentagonal; parallel or anal nervure divergent apically from the cubital; nervellus strongly antefurcal, geniculate and distinctly intercepted.

Schmiedeknecht remarks (Opus. Ichn. 1660) that "the genus *Pyracmon* looks strange between the genera which come nearest. It forms a connecting link between the *Ophioninae* and *Xoridinae*; in my opinion most of the species would be better included in the latter, as is shown not only by the whole structure and habitus, especially the buccate head and the shape of the first segment, but also the mode of life; one finds almost all the species, excepting perhaps *P. fumipennis*, Zett., in dead wood, where they live among beetles, especially *Cerambycidae* and *Buprestidae*." This is another proof of association between cubical-headed parasites with xylophagous hosts (*cf.* Ichn. Britt. iii. 2), though I know none among the former family; Schm. only mentions Kriechbaumer's description of one species out of the Austrian Buprestid, *Anthaxia quadripunctata*, Linn. (referred to by me, Trans. Ent. Soc. 1911, p. 457), and even this may need corroboration in view of Mr. Williams' discovery.

There can, I think from the description of Hartig's preoccupied genus *Ophiodes* (altered to *Ophiogastra* by Ashmead, Canad. Entom. 1900, p. 368), be no doubt whatever that at least the female of his *O. montanus* belongs to the present genus, Holmgren's name for which I retain as having priority over Ashmead's.

Table of Species.

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|------|----|--|-------------------------------|
| (2). | 1. | Tegulae red; hind femora black;
vertex very broad | 1. OBSCURIPES, <i>Holmgr.</i> |
| (1). | 2. | Tegulae white; hind femora red;
areolet petiolate | 2. MONTANUS, <i>Hartig.</i> |

1. obscuripes, Holmgr.

Pyracmon obscuripes, Holmgr. Sv. Ak. Handl. 1858, p. 102; Thoms. O.E. xi. 110, ♀.

A black species with grey pubescence and vertex strongly dilated behind the eyes; mouth and tegulae rufescent, stigma infusate; anterior legs red with coxae and base of trochanters black; hind legs nigrescent with only apices of trochanters and base of their femora dull ferrugineous. Length, 7-9 mm.

This species, of which the ♂ is still unknown, is recognised by the very dark hind legs, rufescent and not black tegulae, centrally angular clypeus and very broad vertex.

Holmgren only knew it in Sweden "in Bahusia; prope urbem Gothoburgum," and it was not again found on the Continent till Thomson recorded it in 1887 as "funnen vid Glimakra i Skane" and at Borgholm in the Baltic Isle of Oland. Elsewhere it is solely recorded from Austria and Schmiedeknecht took it there in 1908 on tree-trunks at Seis, in South Tyrol. This is the only one of the nine palaearctic species hitherto recorded as British; it figures in both Marshall's catalogues, and its inclusion would appear to rest upon Francis Walker's 1869 capture,* enumerated in the former's "Ichneumonidae of the Isle of Man" (Entom. 1872-3, p. 432), since none of our other local lists contains it.

2. montanus, Htg.

Camptoplex megacephalus, Gr. I.E. iii. 502, ♀, excl. var. (?). *Ophiodes montanus*, Htg. Ber. Naturw. Ver. Harz. 1847, col. 19, excl. ♂. *Pyracmon melanurus*, Holmgr. Sv. Ak. Handl. 1858, p. 102, ♂ ♀; Thoms. O.E. xi. 1110, ♀.

A black species with grey pubescence, the areolet not sessile and terebra longer than half abdomen; mouth and tegulae pure white, stigma obscurely infusate; scape beneath and all the legs red with coxae, trochanters, and the hind legs apically black. Length, 6-8 mm.

Thomson considered Holmgren's species a link between the present genus and *Nemeritis gracilis* with its anterior trochanterellus stramineous, the hind ones red; the second segment apically dilated and the four following gradually more strongly compressed, the metathoracic carinae very distinct and mouth pale.

Gravenhorst's single ♀ (not both sexes as given by DT., copied by Schm.), which seems almost certainly synonymous, was from Lusatia; Holmgren took males (this sex was unknown to, not thought distinct by,

* In Farren White's collection (in Mus. Brit.) is a ♀ *Lathroplex infernalis*, labelled by Marshall *Pyracmon obscuripes*, Holmgr., n. sp. for Britain."—C.M.

Thoms.) in grassy places infrequently throughout Sweden, and Dahlbom found the female; Schm. adds that it ranges to central Europe, and Gaulle records it from France; but Tosquinet failed to find the genus in Belgium. This species has not been noticed in Britain before; I possess three females, of which a typical one (though having one wing utterly without areolet) was bred by Thornhill on 9th July from —? *Sesia bembeciformis* in—osiers at Cambridge and two more with basally whitish



hind tibiae were captured, one on 14th June, 1907, at the Wilverly Inclosure and one a few days later at Holiday Hill in the New Forest. Mr. C. B. Williams of The John Innes Horticultural Institution, Merton, Surrey, has confirmed the introduction of this as a British insect (Entom. 1913, p. 8) by breeding an entirely typical female there during 1912 from a larva of the neuropterous genus *Raphidia*; the parasitic grub emerged from a circular hole on one side of the anus of its host's empty larval skin and spun for itself a cylindrical, pure white and somewhat dull cocoon of $6\frac{1}{2}$ mm., whence the imago emerged through an equally circular hole on one side of its capital extremity.

I took the female here figured in my Monks Soham garden on 22nd July, 1908, which seems to represent this species, flying about a dead willow tree.

CANIDIELLA, *Ashmead.*

Ashm. Canad. Entom. 1900, p. 368; *Canidia*, Holmgr. Sv. Ak. Handl. 1858, p. 103 (*nec* Thoms. 1857).

Body small and stout. Head slightly buccate; cheeks subbuccate, elongate and longer than base of mandibles, with their costa subcontinuous; mandibles somewhat long and stout, with acute teeth; clypeus basally hardly discreted and apically rounded, with deeply impressed lateral foveae; eyes small and subentire, peristomium broad and face parallel-sided. Antennae stout; scape black, flagellum subfiliform and not elongate, with only about twenty joints. Thorax gibbulous, short and hardly longer than high; metathorax not apically produced, with its discal areae distinct but costulae wanting; petiolar area elongate and not excavate. Abdomen normally broad and in our species not red; petiole deplanate and double the length of the discreted postpetiole with neither lateral sulci nor scrobes; second segment subtransverse and black, with its incisure red, very rarely pale-margined; terebra reflexed and exerted, of variable length. Legs normal and mainly black, with calcaria not elongate. Wings with areolet nearly always pentagonal and sessile; basal and recurrent nervures vertical, the cubital divergent; brachial cell short; stigma stramineous and somewhat broad; tegulae usually black; nervellus antefurcal, oblique and subgeniculate.

Schmiedeknecht retains Holmgren's name (*Opusc. Ichn.* 1673) for this genus, having mistaken its preoccupation by Thomson in 1857 among Coleoptera for the latter's description of 1887 (*O.E.* 1111).

This genus is best recognised by the always broad, regular and often sessile and pentagonal areolet, the broad abdomen with its often hardly exerted terebra, elongate petiole and short, strongly discreted postpetiole, all of which points render it much the facies of the anomalous Cryptid genera *Stilpnus* and *Phrudus*; this is a similarity worthy of further investigation for natural affinity.

Whether the hosts of the present genus be Lepidopterous as Bignell indicates, or Coleopterous as stated by Brischke, who has paid most attention to the genus, and Ratzeburg is uncertain. The last bred, besides the species indicated below, *C. quinque-angularis*, Ratz., out of larvae of *Hypera arundinis* (*cf.* Trans. Ent. Soc. 1911, p. 479). That they be either, is still open to doubt; and Kreichbaumer's description of *Nemeritis raphidia* (*Entom. Nachr.* 1892, p. 234), bred from larvae of the neuropterous genus *Raphidia*, lends interest to the fact that specimens of that genus emerged along with *Canidiella pusilla* and its supposititious Malacoderm host; *cf.* also Ratzeburg's forgotten *Campoplex incidens*, which was reared from *Raphidia ophiopsis* (*Ichn. d. Forst.* i. 94 *et seqq.*).

Table of Species.

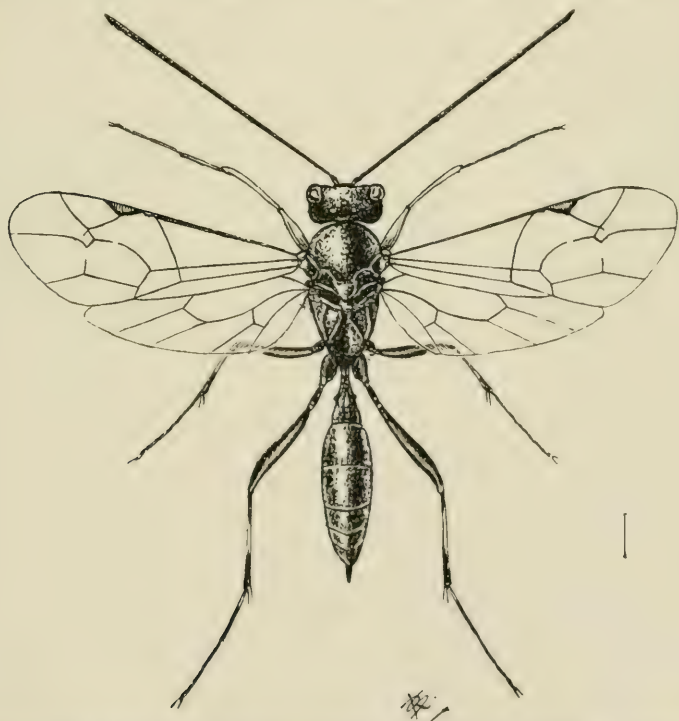
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| (6). | 1. | Arolet pentagonal and broadly sessile. | |
| (5). | 2. | Stout with second segment not elongate; terebra short. | |
| (4). | 3. | Hind tibiae black below; terebra shorter than first segment .. | 1. TRISTIS, <i>Grav.</i> |
| (3). | 4. | Hind tibiae not centrally black; terebra length of first segment .. | 2. SUBCINCTA, <i>Grav.</i> |

- (2). 5. Slender with second segment elongate; terebra longer than half body 3. EXIGUA, Grav.
 (1). 6. Areolet subquadrate and distinctly petiolate.
 (8). 7. Smaller; hind tibiae black and white, not red-marked 4. TROCHANTELLA, Thoms.
 (7). 8. Larger; hind tibiae immaculate clear fulvous throughout .. 5. IMMOLATOR, Grav.

1. *tristis*, Grav.

Campoplex tristis, Gr. I.E. iii. 492, ♂ ♀ (excl. ♀ pedmont.). *Canidia tristis*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 175, ♀. *C. corvina*, Thoms. O.E. xi. 1111, ♂ ♀.

A black species with the cheeks subbuccate, the anterior tibiae and part of their femora red and the hind tibiae centrally white only above;



terebra hardly extending beyond anus and strongly reflexed. Length, $4\frac{1}{2}$ —nearly 7 mm.

Among the largest species of the genus, with the capital vertex not narrow, cheeks subbuccate, legs black with the front femora above and at their apices with their tibiae flavidous, the posterior tibiae with their central third externally only, and the intermediate also basally, dead white.

Genoa and Turin (Grav.); Lund, north and central Germany (Thoms.). It has long been known as British, under the old genus *Limneria*, but was correctly relegated to the present by Brischke, who found females in Prussia, in 1880. Bignell says he has captured it at Bickleigh in Devon about the middle of September and that he bred it there on 22nd June from *Pseudopternia cytisaria*, but I place none too much reliance upon this Lepidopterous host. Capron found a full series about Shere in Surrey; Tuck both sexes at Tostock in Suffolk in June and October, 1900; Piffard took females at Felden in Herts; and I swept another on 9th June, 1902, at Wicken in Cambs.

2. *subcincta*, Grav.

Campoplex subcinctus, Gr. I.E. iii. 494, ♀. *Canidia subcincta*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 175, ♀; (?) Holmgr. Sv. Ak. Handl. 1858, p. 103, ♂ ♀; *C. Curculionis*, Thoms. O.E. xi. 1113, ♀.

Black with the legs not broadly pale, the abdomen but little compressed and thrice longer than the terebra; hind legs with only the tibiae centrally entirely, and basally a little, whitish. Length, $3\frac{3}{4}$ –5 mm.

Thomson says his species is similar to his *C. rostrata* in the abdominal conformation and terebral length but with the mouth not rostrately elongated and the flagellum, as in *C. exigua*, slender with the flagellar joints well discreted. He considered Gravenhorst's species distinct from that of Holmgren, for which he proposed a new name, but I am of opinion that they are forms of the same, both occurring with us and included in the details of capture below, the latter differing mainly in having the abdomen a little narrower with shorter terebra. Ratzeburg's *C. subcinctus* is now generally ascribed to *Omorga borealis*, on Thomson's somewhat indefinite suggestion. The present is at once known from the last species by its more slender form, longer terebra and entirely white-banded hind tibiae, which latter are beneath black throughout in the earlier one. The female of the present is at once known by the terebra being no longer than its basal segment, but the males are difficult to separate from those of the next species.

The two original females were taken by Hope at Netley in Shropshire; it was found by Holmgren occasionally during July and August in Sweden, by Brischke in Prussia and by Gaulle in France. Ratzeburg tells us (Ichn. d. Forst. ii. 80–82) that Dahlbom bred this species from larvae of *Hypera polygoni*, which were feeding upon *Silene* in Lund, on 8th August, 1837: but perhaps his species was not the present. In Britain it has subsequently occurred at Eaton near Norwich in July (Bridg.); Wilson Saunders took a female at Greenings in Surrey during July, 1872; Dalglish another at Kings Cross in Arran in August, 1900; Capron possessed two more from Shere; and I took a few of both sexes in 1900 at Southwold cliffs on *Heracleum sphondylium* flowers on 26th July, in allotment gardens at Aldeburgh in July, and Lakenheath and Brandon early in June, by sweeping *Mentha hirsuta* in ditches at Foxhall in the middle of August; Miss Chawner has sent me a couple from the New Forest and both sexes have occurred to me at Grovely Wood in Wilts at the end of June. It also has been swept by me at Mablethorpe on the Lincs. coast in the middle of June, 1912.

3. *exigua*, Grav.

Campoplex exiguus, Gr. I.E. iii. 499, ♀. *C. pusillus*, Ratz. Ichn. d. Forst. iii. 82, ♀; cf. Thoms. O.E. xi. 1113. *Canidia pusilla*, Holmgr. Sv. Ak. Handl. 1858, p. 104; Brisch. Schr. Nat. Ges. Danz. 1880, p. 175, ♂ ♀. *C. exigua*, Thoms. O.E. xi. 1112, ♂ ♀.

A small black species with the flagellar joints discreted, the legs but little pale marked, the second segment not broader than long and the terebra fully half the length of the somewhat narrow abdomen. Length, $3\frac{1}{2}$ – $4\frac{3}{4}$ mm.

This little species has the flagellum slender with only about eighteen joints, the head not elongate with the vertex by no means broad, the abdomen somewhat compressed with the second segment not transverse, the hind femora slender and their tibiae nigrescent with their centre externally dull white; and rarely the male tegulae white.

I see little justification for transposing *Campoplex pusillus*, Ratz., to *Nemeritis*, as has been proposed by Thomson, since it is this species that Holmgren described; its author indicates it (Ichn. d. Forst. iii. 251) as preying upon the Malacoderm beetle, *Dasytes niger*, Linn.

This is one of the commonest species of the genus both here and abroad; it is constantly seen on the flower-tables of *Heracleum sphondylium* during July; Germany, not uncommon in Sweden, Prussia, France and during August in Belgium. It is recorded from Bickleigh in Devon on 20th August by Bignell, Gunton in Suffolk and Brundall in Norfolk during July and *C. pusilla*, which he considered distinct, from Earham near Norwich in July by Bridgman. I possess a score of specimens in Capron's and others in Saunders' Surrey collections, received it from Bury St. Edmunds and Tostock from Tuck, and have taken it by sweeping in Monk Park Wood in the same district in the middle of May, the New Forest in June, on *Galium verum* at Felixstowe, at Southwold and Theberton in Suffolk on flowers of *Heracleum*, where both sexes were very common at Monk Soham in 1908. It appears to affect the edges of arable land, as I noticed at Salisbury towards the end of June, 1911.

4. *trochantella*, Thoms.

Campoplex tristis, Gr. I.E. iii. 492, ♀ pedmont. *Canidia trochantella*, Thoms. O.E. xi. 1114, ♀.

A black species with the areolet regular and distinctly petiolate, the areola short and pentagonal, anterior legs partly red, tegulae white, posterior tibiae centrally externally and their trochanterellus dull stramineous. Length, 5 – $5\frac{1}{2}$ mm.

This species, of which the ♂ is still unknown, and the next differ from all the preceding in the shape of the alar areolet and metanotal areola, in having the front femora except basally and the intermediate apically red, and the second to seventh segments glaucous margined.

It is not rare in central and southern Europe, extending to the Pyrenees, says Thomson; Gravenhorst knew it only from Piedmont, and Gaulle records it from France. It was first mentioned by Bridgman (Trans. Norf. Soc. 1894, p. 622) as occurring at Earham near Norwich so late as October, but with no note of its novelty in Britain, where it is certainly rare and I possess but three Surrey females in Capron's collection. On

9th September, 1910, I swept a female from reeds on the Suffolk coast at Southwold; and Newbery took another at Newport in the Isle of Wight during 1908.

5. *immolator*, Grav.

Campoplex immolator, Gr. I.E. iii. 491, ♂ ♀. *Canidia immolator*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 175, ♀. *Limneria immolator*, Bridg.-Fitch, Entom. 1885, p. 107, ♂ ♀.

A black species with the areolet regular and distinctly petiolate, the areola short and pentagonal, anterior legs red from near base of femora, tegulae white, posterior tibiae entirely, their trochanterellus and apices of femora fulvous. Length, $6\frac{1}{4}$ – $6\frac{1}{2}$ mm.

Agrees with the last species in the shape of areolet and areola, in the centrally subexplanate abdomen and front pedal colour, but the posterior legs are clear fulvous with coxae, base of trochanters, of the intermediate and basal two-thirds of hind femora black, the antennae are longer and apically more attenuate with apical joints strongly discreted, the petiole is distinctly a little longer and less abruptly dilated centrally, the terebra is slightly exerted and the size larger.

Brischke ascribed this species, which had long stood in our list under *Limneria*, to its correct genus on Prussian specimens in 1880; Grav. had it from Nuremberg and Volhynia, but it seems rare in central Europe; France (Gaulle) and taken as early as April in Belgium (Tosquinet). With us it is very rare and I owe a knowledge of it to single females in Piffard's Hertfordshire and Capron's Surrey collections.

NEPIESTA, Thomson.

Thoms. Opusc. Ent. xi. 1116.

Head dull, coarsely and alutaceously punctate; vertex somewhat broad and not constricted behind the internally hardly emarginate eyes; clypeus not basally discreted, with deeply impressed lateral foveae; face distinctly transverse, peristomium ample, cheeks elongate; mandibles stout, with acute teeth. Antennae hardly longer than half body, with scape black. Thorax subcylindrical, longer than high, punctate and dull; mesopleural speculum glittering; metathorax rugosely punctate, with indistinct areae; areola elongate and apically incomplete, with no costulae. Scutellum convex. Abdomen elongate, apically subclavate; basal segment curved and extending to trochanteral apex, with no lateral sulci; postpetiole a little longer than broad, hardly broader than but double length of petiole, with no lateral scrobæ; second segment finely and alutaceously punctate, elongate; third quadrate, terebra not exerted. Legs somewhat slender, with hind femora subincrassate and mainly black; hind calcaria about half length of metatarsi. Wings with tegulae pale; areolet wanting, with the intercubital nervure distinctly longer than its distance from second recurrent; basal nervure continuous; radial cell somewhat short and not acutely angled centrally, with its apical abscissa but little the longer; apex of discoidal cell rectangular below; nervellus oblique, antefurcal, and strongly geniculate at its lower fourth.

The abdominal shape allies this genus to *Casiniaria* and our species is somewhat like the male of *C. morionella*, though more slender, with no areolet and the eyes not at all emarginate. The approximation of the

second recurrent to the inner nervure of the lacking areolet, elongate and slender petiole, and concealed terebra render it distinct; as do the black posterior femora and antefurcal nervellus of our species.

1. aberrans, Grav.

Campoplex perfidus, Gr. I.E. iii. 595, ♀ (?). *C. anomolus* [sic], Gr. l.c. 490, ♀. *C. aberrans*, Gr. l.c. 496, ♂. *Limneria mandibularis*, Holmgr. Sv. Ak. Handl. 1858, p. 97, ♂ ♀. *L. aberrans*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 172, ♂ ♀. *Nepiesta aberrans*, Thoms. O.E. xi. 1116, ♂ ♀.

A black and slender species with the mandibles ferruginous, tegulae white; tibiae with the front, and apices of the black posterior, femora fulvous; hind tibiae hardly infuscate apically; head and thorax coarsely and strongly punctate. Length, $6-6\frac{3}{4}$ mm.

It is a black and sparsely grey-pilose species with at most the metathorax centrally bicarinate to beyond its centre, though not laterally; the stigma is narrow and very pale testaceous, emitting radius from beyond its centre; radial cell narrow, etc.

There are records from central Lapland in July, Prussia, Italy, France, Gottingen, Hanover in June, and Schmiedeknecht finds it in the spring by no means rarely in Thuringia. *Limneria mandibularis* was introduced as British (Trans. Ent. Soc. 1887, p. 367) since Dr. Capron had taken at Shere five specimens, now in my collection with one from Albert Piffard's, probably from the same source; this was the year that Thomson synonymised it with *N. aberrans*, and consequently we must suppose Bridgman to have previously been ignorant of the species and to have incorrectly named the male, which Fitch says was raised by Elisha (Entom. 1881, p. 140) from *Laverna conturbatella*. Capron's are almost the only known indigenous examples, since I have not met with it and no local list mentions it, excepting a single male (Trans. Norf. Soc. 1894, p. 619) captured in June at Earlham near Norwich.

NEMERITIS, Holmgren.

Holmgr. Sv. Ak. Handl. 1858, p. 104.

Body very slender and strongly elongate. Head transverse and anteriorly subcircular, much broader than thorax; vertex not narrow; clypeus a little convex and apically subtruncate, with its lateral foveae small; mandibles small and flavidous, peristomium not large; eyes entire and cheeks subbuccate. Antennae slender, filiform and longer than half body, with scape usually pale beneath. Thorax longer than high, subcylindrical and elongate; metathorax gradually declived from base to apex, which is always slightly produced beyond the hind coxal base; areola oblong and pentagonal, emitting costulae distinctly before its centre; petiolar area short. Abdomen elongate, narrow and towards the anus compressed; basal segment but little curved with no or obsolete lateral sulci; postpetiole hardly broader than petiole, with no lateral scrobes; second segment alutaceous and somewhat dull, longer than broad and obviously than the third, apically dilated and generally with its apical margin rufescent; terebra elongately exerted, often as long as abdomen, with the spicula very slender. Legs slender, the hind ones obviously a little stouter and longer, with the unequal calcaria not elon-

gate nor their tibiae centrally white; two apical hind tarsal joints of subequal length, with small unguiculi and claws. Wings with tegulae always whitish; areolet small and oblique, or wanting; cubital nervure divergent from basal; discoidal cell longer than brachial and its apex subacutely angled below; nervellus oblique and subgeniculate.

Known by its very slender form, scabrous second segment, apically produced and evenly declived metathorax, the broad head and wanting or strongly oblique areolet. Our first two species are placed in Förster's typeless genus *Phaedroctonus* by Schmiedeknecht, on account of their lacking areolet, though in every other respect they are entirely conformable with the remainder, and, if needed, Bridgman's female supplies a connecting link in its elongate antennae and somewhat sharply angled radial cell; to adopt this genus is ridiculous, since specimens frequently occur with areolet in one wing only. Some species bear a strong superficial resemblance to the *Cremastides*, with which they must not be confounded.

Table of Species.

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| (4). | 1. Radial cell subangled below; areolet wanting. | |
| (3). | 2. Postpetiole shining, smooth; terebra half abdominal length | 1. TRANSFUGA, <i>Grav.</i> |
| (2). | 3. Postpetiole dull, scabrous; terebra nearly abdominal length | 2. CREMASTOIDES, <i>Hlmgr.</i> |
| (1). | 4. Radial cell hardly angled below; areolet small and oblique. | |
| (6). | 5. Whole legs entirely red throughout | 3. RUFIPES, <i>Bridg.</i> |
| (5). | 6. Legs with at least the hind coxae entirely black. | |
| (12). | 7. Hind legs mainly pale; abdomen nearly entirely black. | |
| (11). | 8. Second segment elongate; hind femora red. | |
| (10). | 9. Head broad behind; hind tibiae basally white | 4. SORDIDA, <i>Grav.</i> |
| (9). | 10. Head narrower; hind legs not white-marked | 5. GRACILIS, <i>Grav.</i> |
| (8). | 11. Second segment quadrate; hind femora piceous | 6. LATIVENTRIS, <i>Thoms.</i> |
| (7). | 12. Hind legs entirely black; abdomen laterally pale | 7. CANESCENS, <i>Grav.</i> |

1. *transfuga*, *Grav.*

Campoplex transfuga, Gr. I.E. iii. 521; Ratz. Ichn. d. Forst. ii. 85 et iii. 88, ♂ ♀. *Limneria transfuga*, Holmgr. Sv. Ak. Handl. 1858, p. 97; Brisch. Schr. Nat. Ges. Danz. 1880, p. 172, ♂ ♀. *Nemeritis transfuga*, Thoms. O.E. xi. 1118, ♂ ♀.

A black species with the hind legs somewhat broadly infusate with the trochanterellus pale; terebra half length of abdomen; areolet wanting; postpetiole smooth, shining and but half length of the petiole; anterior legs red, basally stramineous. Length, 5-5½ mm.

At once known by the lacking areolet, and infusate hind femora and tibiae, the broad and elongate radial cell and very slender petiole.

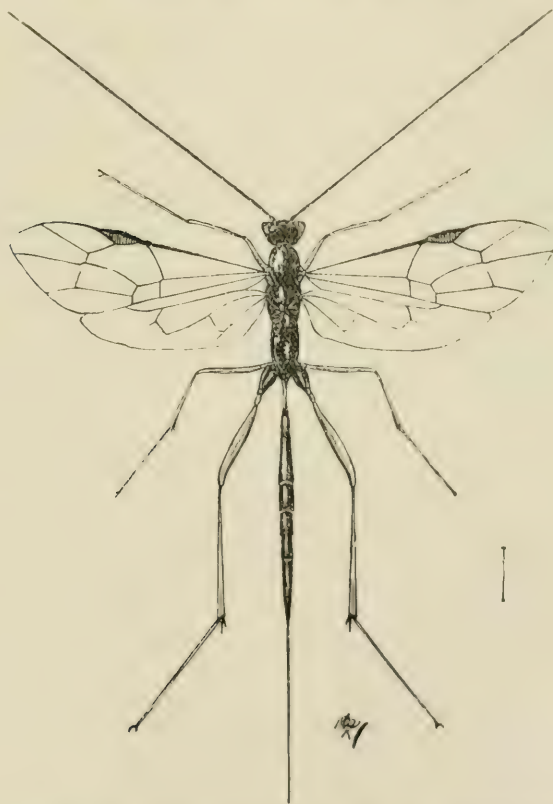
It is said to be rare in northern and central Europe and to have been

bred by Brischke from *Dioryctria abietella*, by Schm. Desvignes considered it to be represented in the British Museum in 1856; but it has hitherto been treated in our catalogues under the genus *Limneria*. It was bred by Fitch (Entom. 1880, p. 68) from *Scythropia crataegella*, recorded by Bridgman (*l.c.* 1884, p. 70) with a query from *Tischeria emyella* and found by Bignell at Bickleigh in Devon during early June. I possess four females in Capron's Surrey collection.

2. *cremastoides*, Holmgr.

Nemeritis cremastoides, Holmgr. Sv. Ak. Handl. 1858, p. 105; Brisch. Schr. Nat. Ges. Danz. 1880, p. 177, ♀; Thoms. O.E. xi. 1118, ♂ ♀.

A black species with the hind legs fulvous, their coxae black and tibiae subinfusate apically and before the base; abdomen of ♀ a third longer than the terebra, with seventh segment excised. Length, 6–8 mm.



Instantly known by lacking areolet, and its dull and subscabrous post-petiole, which is but little shorter than the petiole.

Not widely distributed; Sweden, Prussia where Brischke bred it from leaf-mining *Diptera* in hops, France and Belgium; bred from fir cones in Thuringia and according to Gaulle from *Gracillaria syringella*. Known

as British since 1870 and our only common species of the present genus, occurring about *Pinus sylvestris* in May and June, August and September. Bignell has captured it at Bickleigh in July and reared it in South Devon in the middle of May from fir cones containing *Coccyx strobilella*; and this appears to be its usual host, for Bankes has given me a female bred at Merton in Norfolk from the same moth on May 14th, 1896, and took it flying at Corfe Castle in Dorset on 29th May; Durrant has given me a series of both sexes with subcubical head bred from this host by Barrett and I found a female of the same form on 27th June, 1908, at a boring of *Anobium domesticum* in the old timber of a garden hut at Monk Soham, where the normal form is very common on house windows, doubtless flown in from the garden fir-trees; Tuck found it in Finborough Park and at Tostock during 1900, also in Suffolk. Charbonnier took it at Acton near Bristol, Saunders at Greenings, both in June, and de la Garde captured the male at Devonport during May, 1895.

3. *rufipes*, Bridg.

Nemeritis rufipes, Bridg. Trans. Ent. Soc. 1883, p. 166, ♀.

A black species with the terebra fully two-thirds the abdominal length, and all the legs entirely red; areolet oblique and elongately petiolate. Length, $6\frac{1}{2}$ – $7\frac{1}{2}$ mm.

This species, which does not appear to be yet known outside England and still has no male assigned to it, is remarkable for the lack of black-markings on the hind coxae; in conformation and structure it almost exactly resembles *N. cremastoides*—not *N. macrocentra*, as stated by its author—but the strong areolet and pedal colour are very distinct.

The type was found by Dr. Edward Capron about Shere in Surrey; the original female is in Bridgman's collection in the Norwich Castle Museum and five co-types are in my own collection from the same source.

4. *sordida*, Grav.

Campoplex sordidus, Gr. I.E. iii. 466, ♀. *Limneria sordida*, Bridg.-Fitch, Entom. 1885, p. 107, ♀. *Nemeritis sordida*, Thoms. O.E. xi. 1118.

Black with the anterior legs red, their trochanters and front coxae apically nearly citrinous; hind legs also red with the coxae, base of trochanters and sometimes a mark near their femoral apex black, their tibiae dull red and bifuscous with a basal white band; vertex somewhat broad and posteriorly hardly constricted; and the terebra nearly as long as abdomen. Length, 7 mm.

I know but one Surrey female of this species, which Schm. considers rare on the Continent; Gravenhorst described Silesian females. It is now well authenticated as British; first given as indigenous, under the genus *Campoplex*, by Desvignes in 1856; recorded (Entom. 1884, p. 70) from English *Lycaena alsus* by Bridgman; and captured on 2nd August by Bignell at Cattedown Quarry in Devon. During November, 1912, Mr. W. Falconer was good enough to send me another female of this species found "under a stone on the moors near Huddersfield at 1000 feet, about to attack a spider, *Centromeria concinna*, or its cocoon," which latter was also forwarded.

5. *gracilis*, Grav.

Campoplex gracilis, Gr. I.E. iii. 511, ♂. *C. macrocentrus*, Gr. lib. cit. 519, ♀. *Nemeritis macrocentra*, Holmgr. Sv. Ak. Handl. 1858, p. 105; Brisch. Schr. Nat. Ges. Danz. 1880, p. 177; lib. cit. 1892, p. 45; Thoms. O.E. xi. 1118, ♂ ♀. *Linneria gracilis*, Brisch. lib. cit. 1880, p. 150, ♂; nec Bridg. Trans. Ent. Soc. 1884, p. 427.

A black species with the legs partly red and flavidous, and the terebra a little shorter than the abdomen. Length, $5\frac{1}{2}$ –7 mm.

Similar to *N. sordida* in colouration but with the vertex narrower and somewhat roundly constricted behind the eyes, the calcaria a little shorter and the anterior legs of the male basally, with centre of its hind tibiae, substramineous. The later Gravenhorstian name has hitherto been in use, but, since the obvious synonymy of Gravenhorst's male is unhesitatingly stated by Thomson, only Bridgman's species remains doubtful.

This is one of the commonest of the genus on the Continent, though quite the reverse seems to be the case with us. It has been known as British since 1870; it is recorded by Bridgman from Lynn in Norfolk and as bred by Porritt from both *Psycholoma lecheana* and *Scoparia coardella* (Trans. Norf. Soc. 1894, p. 622). Bignell captured it at Plym Bridge at the end of May; but I possess only a few females in Capron's Surrey and Piffard's Herts collections, from Niton in the Isle of Wight, where Marshall captured it, Tostock in Suffolk during early September, and Cromer in August, 1903.

6. *lativentris*, Thoms.

Nemeritis lativentris, Thoms. O.E. xi. 119, ♂ ♀.

Black with the anterior legs mainly pale, the terebra nearly as long as abdomen, which has second segment subquadrate. Length, $4-4\frac{1}{2}$ mm.

A small species with the postpetiole subquadrate and the second segment not longer than apically broad, with its apical margin broadly red.

I possess four females named "*lativentris*, Thoms." by Capron with a query, which he captured twenty years ago about Shere in Surrey; I consider his tentative identification probably correct, since they differ from the description only in having the abdomen but narrowly red-banded centrally. Elsewhere it has not been taken, since first described from Gottland in Sweden by its author.

7. *canescens*, Grav.

Campoplex canescens, Gr. I.E. iii. 555, ♀. *Nemeritis canescens*, Thoms. O.E. xi. 1120, ♂ ♀. *Amorphota ephestiae*, Cam. Proc. Linn. Soc. N. S. Wales, 1912, p. 187. *Idexthis oahuensis*, Ashm. Fauna Hawaiensis, i, 1901, p. 355.

A slender black species, with grey pubescence. Antennae somewhat longer than half body. Thorax black, with the metathorax not shining. Abdomen twice as long and only half as broad as thorax, laterally strongly compressed with the fourth to seventh segments, and ventral surface, fulvidous or flavidous; petiole strongly elongate and about double length of the broader postpetiole; terebra a little longer than half abdomen. Legs rufescent with the front coxae and trochanters flavous; intermediate

legs piceous-fulvous with their coxae, trochanters and base of tibiae flavidous; hind legs black or piceous, with only extreme apices of coxae and trochanters paler. Wings not ample; areolet sessile and triangular. Length, 6 mm.

In its slender body and petiolar structure it approaches *N. transfuga*, though differing in its areolet and dull metathorax. From our indigenous species, this is known by the black hind legs and mainly red abdomen.

Mr. E. G. Bayford of Barnsley was so good as to send me early in October, 1912, a female of this south European species, which extends to Asia Minor and even Japan (though it certainly is none of the specimens recorded from the latter by Francis Walker in Cist. Ent. 1874, pp. 301-310, the types of all which I have examined), with these notes:—"I am not aware what its host is, but should say it will be *Tenebrioidea mauritanicus*, *Tenebrio molitor* or *Ephestia Kuhlmanniella*, as it was found in a flour mill near here—in the middle room only, where the more advanced processes of milling take place. In this room it was not uncommon, while in the upper and lower rooms I did not see a single specimen, although access to them from the outside was much easier. This seemed to me to dispose of the possibility of their having come from the outside." Doubtless this parasite has been introduced into Britain along with the above extremely injurious Crambite: its propagation should be encouraged by every means. I find Mr. Donisthorpe also took two females during August, 1910, at Southsea in Hants.

This is the species erroneously recorded by Theobald upon my own misidentification, *Olesicampa fulviventrifera* (Report Wye Agric. College, 1912). It has been described as new by Peter Cameron (Proc. Linn. Soc. N.S. Wales, 1912, p. 187), with the remark "Common in flour mills in Victoria and New South Wales. Parasitic on the introduced flour moth, *Ephestia Kuhlmanniella*. This parasite has been recently found in a number of flour mills in New South Wales (Sydney, Wellington, etc.), where they infest the larvae of the Mediterranean Flour moth. It is also known in England, and the King Flour Mills of Ellerman Point proposed to introduce them into Australia before it was discovered that they were well known in this country." I have seen the Sandwich Islands type of Ashmead's name in the British Museum and find it in all ways synonymous.

PHOBOCAMPA, Thomson.

Thoms. O.E. xi., 1887, 1120.

Head short and constricted both apically and behind the eyes; mandibles, peristomium and lateral clypeal foveae small; cheeks short. Antennae elongate with the scape usually pale beneath, the flagellum sub-pilose and apically attenuate. Thorax gibbous, with a white callosity before the radices; mesopleurae very finely alutaceous and mesosternum transverse; metathorax short, with fine carinae; areola transverse and often apically incomplete; petiolar area extending beyond the centre. Abdomen stout with the basal segment both stout and deplanate; post-petiole only half length of the petiole, usually quadrate or transverse, with the lateral scrobes narrow and sulci small; second segment very rarely longer than broad with thyridii large and its apical margin, with sometimes the third segment, usually pale; ventral plica stramineous and

terebra not extending beyond the anus. Legs somewhat stout, with elongate calcaria; hind tibiae spinulose and usually whitish, with unguiculi and claws small. Wings with tegulae whitish and stigma somewhat large; areolet minute and oblique, with a short and stout petiole; apical abscissa of radial nervure elongate and forming nearly a right angle with the basal; discoidal cell a little longer than the brachial, its apex strongly acute below; nervellus and the postfurcal lower basal nervure strongly oblique.

Recognised by its short and convex thorax and abdomen of which the ♀ has the latter centrally dilated, the invariably pale radical callosities, deplanate postpetiole, conspicuous thyridii, small and irregular areolet, strongly acute discoidal cell and concealed terebra, but particularly by the remarkably oblique lower basal nervure. The structure of the last is shared by *Spudastica*, in which the petiole is elongate and the metanotal areae wanting; the pupa of *P. alticollis*, Thoms., bred from *Hypsipetes elutaria*, is also said to be similar.

Table of Species.

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|------|----|---|-------------------------|
| (6). | 1. | Scape beneath and anterior coxae stramineous; postpetiole quadrate. | |
| (3). | 2. | Second segment alone apically pale; hind tibiae not basally dark | 1. CRASSIUSCULA, Grav. |
| (2). | 3. | First or third segment also red-marked; hind tibiae basally black. | |
| (5). | 4. | Hind coxae and postpetiole red; hind tarsi dark | 2. UNICINCTA, Grav. |
| (4). | 5. | Hind coxae and apex of third segment red; hind tarsi basally white | 3. BICINGULATA, Grav. |
| (1). | 6. | Scape mainly and anterior coxae basally black; postpetiole elongate | 4. OBSCURELLA, Holmgr.* |

1. crassiuscula, Grav.

Campoplex crassiusculus, Gr. I.E. iii. 531, ♀. *Limmeria crassiuscula*, Woldst. Bull. Acad. Petersb. 1876, p. 393, ♂; Brisch. Schr. Nat. Ges. Danz. 1880, p. 165, ♂ ♀. *Phobocampa crassiuscula*, Thoms. O.E. xi. 1121, ♂ ♀.

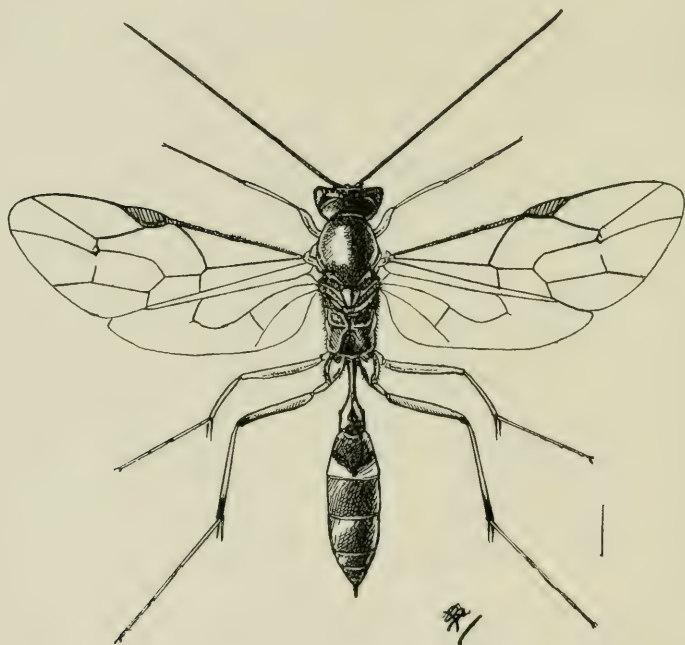
Black, with the second segment apically red; hind legs with coxae black and rarely discally red-marked, their tibiae white with the base rarely infusate but apex distinctly nigrescent, their femora red and apically black; underside of scape and the anterior coxae stramineous; anterior legs pale fulvidous and postpetiole quadrate. Length, $4\frac{1}{2}$ –6 mm.

Known from all the other species by the dull and linear mesosternal impression beneath the speculum, the less distinct metanotal carinae,

* *Limmeria Dumeticola*, Holmgr. (Sv. Ak. Handl. 1858, p. 77, ♀; not since mentioned by any author), is most closely allied in our fauna to *P. obscurella* and known only from Sweden, where Thomson did not meet with it. We have no real claim to it as British for the only reference is by Bairstow (Trans. Yorks. Nat. Union, 1882, p. 106), who prefaces it with a query, from York in 1881, remarking "Mr. Bridgman says of this 'that it approaches nearest the description of *dumeticola* but not exactly' and adds that 'it does not agree with any recorded British *Limmeria*.'" Holmgren's ♀ is so little known everywhere that it would be premature to admit it upon such inconclusive evidence.

broad petiolar area, not strongly constricted face, whitish hind tarsi and by the abdominal colouration.

It would appear commoner with us than upon the Continent; Sweden and Germany (Thoms.), France (Gaulle) and in Belgium during April and June (Tosq.). A cocoon I possess is, as described by Gravenhorst, pale grey with both extremities black, preceded by a circle of often obsolete large black spots or irregular lines, and measures $5\frac{1}{2} \times 3\frac{1}{4}$ mm.; those of the male are said to be smaller and darker than of the female by Brischke, who (*l.c.*) bred it from *Eupithecia exiguaria*, *E. satyraria* and *E. actaearia* in Prussia. With us it has been raised from *Limacodes asellus*, *Acronycta alni*, *A. psi* and captured at Earham near Norwich (Trans. Norf. Soc. 1894,



p. 620); bred in Devon on 10th August from a half-grown larva of *Dicranura vinula* (Bignell, Entom. 1883, p. 66 et Devon. Assoc. 1898, p. 491). It is not rare with us and I have a series from Shere in Surrey, Felden in Herts, Ely in Cambs.; Gosfield in Essex, where I swept a female on 14th May, 1902; Bentley Woods and Assington Thicks in Suffolk, where both sexes occur sparingly on birch undergrowth in the middle of May. Mason has given me a female bred on 1st April, 1905, from a larva of *Drepana falcataria* at Market Rasen in Lincs; and another emerged as early as 7th March, 1904, from an unknown host in my boxes. I swept the cocoon from herbage in June, 1901, and took the dead and perfect imago from it during the following December; Lyle has bred it from a similar cocoon out of *Cheimatobia brumata*, and tells me that *Mesochorus confusus* is parasitic upon it, in the New Forest.

2. *unicincta*, Grav.

Campoplex unicinctus, Gr. I.E. iii. 529, excl. ♀ (nec Holmgr.). *Limneria unicincta*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 165; Bridg.-Fitch, Entom. 1885, p. 206, ♂ ♀. *Phobocampa confusa*, Thoms. O.E. xi. 1122, ♂ ♀.

Black, abdomen with the quadrate postpetiole and apical two-thirds of second segment red; legs red with hind tibiae externally dull stramineous and both base and apex black, and tarsi infusate; underside of scape and the anterior coxae stramineous; anterior legs pale fulvidous. Length, nearly 6 mm.

Larger than *P. crassiuscula* with the abdomen more sparsely pubescent and strongly nitidulous, with differently coloured legs and postpetiole.

Thomson gave a new name to the ♂ of Grav.'s species, leaving the ♀, with exerted terebra, unnoticed; since it is *Limneria unicincta*, Grav., that Marshall gave as British in 1870, I prefer to here retain the earlier name, leaving the female for a new one.

Not common abroad; Germany (Thoms.), Belgium in July and August (Tosq.); Gravenhorst's single male was from Helmstedt in Brunswick; Brischke bred it from a geometer larva and his probably distinct var. from those of *Vanessa polychloros* and *V. urticae*; the cocoon, he adds (*l.c.*) "fast kugelrund, fest, schwarz, braun übersponnen, besonders in der Mitte, so dass eine Mittelzone entsteht." Fitch tells us (Entom. 1883, p. 66) that it has been raised in Britain from *V. urticae*, *Orgyia pudibunda*, *Odontopera bidentata*, *Eupithecia rectangulata*, *Pterophorus galactodactylus*, *Limacodes asellus* and *Acronycta psi*; but all these with *A. alni* (*l.c.* 1884, p. 70), must be regarded with suspicion as ante-Thomsonian, and the last three are given under *L. crassiuscula* by Bridgman in 1894, though the *Pterophorus* is confirmed at Proc. S. Lond. Ent. Soc. 1890, p. 86. In 1898, Bignell adds Devon *Lomaspilis marginata*, *Cheimatobia brumata* and *Acronycta ligustri* to its hosts.

3. *bicingulata*, Grav.

Campoplex bicingulatus, Gr. I.E. iii. 527; Holmgr. Sv. Ak. Handl. 1854, p. 19, ♂ ♀. *Limneria bicingulata*, Holmgr. *loc. cit.* 1858, p. 80; Bridg.-Fitch, Entom. 1885, p. 206, ♂ ♀. *Phobocampa bicingulata*, Thoms. O.E. xi. 1122, ♂ ♀.

A black species, with the apical half of the second and third segments red; hind legs with the coxae black, femora immaculate fulvous, tibiae white and distinctly nigrescent both apically and basally; underside of scape and the anterior coxae stramineous; anterior legs pale fulvidous and postpetiole quadrate. Length, 5-5½ mm.

Known by the basally narrower petiolar area, glittering speculum, rather longer postpetiole, apically strongly constricted ♀ face, basally white hind tarsi, abdominal colouration and longer discoidal cell.

The commonest Continental species and by no means infrequent with us; found by its author in May, June and August; it is not common in July and August in Sweden; Belgium and France. Fitch has recorded it (Entom. 1883, p. 66) as bred from *Hybernia progemma* by Bignell on 1st July in Devon; and Gaulle says from *Cosmia trapezina*. Bridgman found it in August at Earham near Norwich, and it is queried from the Isle of Man by Marshall (*l.c.* 1872, p. 432). I have a good many specimens from Piffard's Herts and Capron's Surrey collections; Col. Yerbury

gave me a female from Tarrington in Hereford, taken on 13th July, 1902, and it has twice occurred to me in the New Forest, on 4th August at Lyndhurst and on 5th July, 1907, one emerged from its dull dark grey cocoon of exactly 5×3 mm. with both ends entirely, and a large-spotted band before both, black which I swept from herbage in Holidayhill Inclosure on the 18th of the previous month. Saunders took it at Reigate in July, 1872.

4. *obscura*, Holmgr.

Limneria obscura, Holmgr. Sv. Ak. Handl. 1858, p. 75; Bridg.-Fitch, Entom. 1885, p. 107, ♂ ♀. *Phobocampa obscura*, Thoms. O.E. xi. 1123, ♀.

Black with the anterior femora and tibiae red; hind legs with the tibiae pale testaceous and a little nigrescent at both extremities, the coxae and hind femora black; anterior coxae apically pale, and trochanters stramineous flavous with the hind ones basally black; scape entirely black or only pale-spotted beneath; abdomen somewhat shining with the second segment rarely subcastaneous apically, and the postpetiole distinctly a little longer than broad. Length, $4\frac{1}{2}$ – $5\frac{1}{2}$ mm.

At once known from our other species by the darker scape, subimmaculate black abdomen and longer postpetiole.

It is said to occur very rarely in north and central Europe; Holmgren records a very few of both sexes in Sweden during early July, but Thomson thought the female "sallsynt." With us it was first found by Francis Walker in the Isle of Man in 1869 (Entom. 1872, p. 432); it has been bred from *Orygia antiqua* and *Hemitea thymiarum* by Bignell (Fitch, Entom. 1881, p. 140). I have taken but a single pair, of which the male occurred on *Angelica sylvestris* flowers at Foxhall near Ipswich on 23rd September, 1899, and the female was swept at Winterton on the Norfolk coast on 11th June, 1901, from a hedge-bottom at dusk.

SPUDASTICA, Thomson.

Thoms. O.E. xi. 1887, 1123.

Head grey-pilose with the vertex hardly narrowed behind the large and internally distinctly a little emarginate eyes; cheeks short, mandibles and peristomium large. Antennae hardly longer than half body, of ♀ shorter with the apical joints strongly discreted, of ♂ centrally subincrassate. Thorax gibbulous and densely grey-pubescent; metathorax scabrous, short and declivous throughout with no trace of carinae. Abdomen immaculate black; petiole elongate and nearly straight, with small lateral sulci; postpetiole but little explanate, convex and a little longer than broad; terebra as long as basal segment. Legs somewhat stout and not elongate. Wings with stigma large and subtriangular; areolet broad, sessile and obliquely triangular, emitting recurrent nervure distinctly beyond its centre; nervellus and lower basal nervure very strongly oblique, the former geniculate only just above its lower extremity.

The single species is instantly known by the subvertical metathorax with no arcae, short antennae, elongate petiole and remarkably oblique lower basal nervure. Bridgman points out some analogy between this genus and *Casinaria* in the lacking metanotal carinae and somewhat emarginate eyes, but the latter character is here much less pronounced and the terebra exerted.

1. *Kriechbaumeri*, Bridg.

Limneria Kriechbaumeri, Bridg. Trans. Ent. Soc. 1882, p. 151; Bridg.-Fitch, Entom. 1885, p. 106, ♂ ♀. *Spudastica petiolaris*, Thoms. O.E. xi. 1123, ♂ ♀.

A black species, with the red legs basally black and hind tibiae basally white; terebra hardly longer than basal segment and the mouth pale. Length, 6–7 mm.

The short, stout and apically incurved antennae, white tegulae, infusate abdominal plica, hyaline wings emitting recurrent beyond centre of subsessile areolet are distinctive. The legs in life are a beautiful clear fulvous; the hind tarsal joints are apically black and the ♂ flagellum subfusiform and stout.



The sexual types were bred by Bignell on 20th April, 1882, from half-grown larvae of *Taeniocampa instabilis*, but this name is evidently a misprint—corrected at Entom. 1882, p. 66—for Bignell wrote (Entom. 1882, p. 215) that he had raised it “from the larva of *Taeniocampa stabilis*, and it always emerges when its victim is nearly ready to moult for the fourth time. Its cocoon is oval in shape, and of a chocolate colour, with a central whity-brown zone, and is 6 mm. in length and 4 in breadth. I have known it to jump four feet in a horizontal direction, and about two feet when a perpendicular bound has been tried. I have closely watched it many times, but could never see any preparation by contraction or otherwise before the jump; and from experiments I have made with cocoons I am convinced that the jumping is done to secure for themselves

shelter during the time the species is in pupa, for I find if they are taken from the leaf and placed in moss they soon work themselves down by rolling from one side to the other, but if placed in a box the jumping continues many days; and I have every reason to believe that they get so exhausted with the effort that they seldom come to maturity. *L. Kriechbaumeri* escapes from its victim, while the larva is on the tree, in the beginning of June, and does not emerge from the cocoon until the following April. I believe it confines its attacks to *T. stabilis*; so far I have not obtained it from anything else."

Thomson records his *S. petiolaris* from Sweden and Germany, where Kriechbaumer bred it from *Tethea oo*, and describes the cocoon as nästan rund, svartbrun med lergra zon. This is synonymised with his own species by Bridgman (E.M.M. 1888, p. 163); and he tells us that "by holding the cocoon up to the light it is easy to see how the jumping is done. The larva presses the middle of the body against one side, and then curves the head and tail until they touch the opposite side of the cocoon a little way from the ends; it is then seen to blow itself out as if trying to burst, till at last the head and tail can no longer resist the pressure, when they instantly give way, but so rapidly, that I could not see the motion, but when they gave way, I could feel the smart rap on the cocoon, as well as hear it. After the larva had straightened itself, it resumed its former size and shape, and lay still at the bottom of the cocoon till it began the movement again . . . These have only been bred from *Taeniocampa*; I have received it from *T. gracilis*, *T. instabilis*"—perpetuated at Trans. Norf. Soc. 1894, p. 621—"and from a doubtful species."

It appears rare on the Continent; Gaulle records it from France and Bloesch has a note on it in Feuille jeun. Nat. 1895, p. 75, in which year Bignell added details in Entom., p. 82; and in the Devon Assoc. 1898, p. 467, he says the cocoon is "made by the larva on its leaving its host; directly after leaving the maggot-like form suspends itself by a silken thread, previously attached to the tree on which its host was feeding, and commences to make its future abode, in which it has to pass the winter. . . . It is after the cocoon is made that the wonder and agility of the larva must be looked upon by all who have seen it with the greatest astonishment. Shortly after the aerial cocoon is finished it is blown down by the wind; but supposing there is no wind, or not sufficiently strong to blow it down, it begins to bound about with a view of breaking the suspending cord. When that is accomplished, and it feels itself on the ground, the cocoon begins to jump about, making leaps three hundred times its own length, until it has jumped or bounded into a place whence it cannot extricate itself. It then commences to roll until it finds itself fixed. It is then satisfied, and no further attempt is made; but remove it from the spot after some days, and it will again go through the same performance, and repeat it as often as it is removed."*

The imago must be very retiring in its habits, and the few I have seen were nearly all bred: Christy sent me a female, raised on 10th May, 1899, from New Forest *Taeniocampa gracilis*; there is another in Capron's Surrey collection, together with its smooth and pale chocolate-coloured

* Novel as these authors regarded the saltatory powers of this cocoon, I find the knowledge of it by no means new; for Lady Fenn tells us curiously, in an ancient "Short History of Insects to those who visit the Leverian Museum" (Norwich, 1797), under the heading *Ichneumon*, p. 44, "The larvae when on the point of turning to chrysalids, spin a silken cod; THESE CODS LEAP."

cocoon with a rough central grey girdle, attached to a leaf by a cord composed of several whitish strands, 7 mm. in length; a similar cocoon, though smaller, was swept in the Bentley Woods near Ipswich on 21st June, 1901, but failed to emerge, in spite of a fully developed and soft, dead male, which I took from it during the following December. The only wild captures I have met with are Bridgman's in 1894 from Brundall near Norwich, a female I swept at Ranworth Broad on 15th June, 1901, and another at Barton Mills on 12th June, 1900. In 1903 Hamm sent me a couple of *Pimplae*, with the note that they had certainly emerged from the accompanying cocoons of the present species at Basingstoke. Elliott swept a cocoon in a wood on 11th June, 1912, near Market Rasen in Lincs.; this I kept under observation in my study all the summer; and the imago did not emerge till early the following April, confirming Bignell's remarks.

ECPHOROPSIS, *Ashmead*.

Ashm. Canad. Entom. 1900, p. 368; *Echpora*, Thoms. O.E. 1887, 1124 (*nec* Conr. 1843).

Head hardly constricted behind the internally entire eyes; apex of clypeus smooth and centrally slightly produced, its base not discreted; mandibles somewhat large, with acute teeth; cheeks little buccate, with their costa subinflexed. Antennae with the scape nearly always black and flagellar joints discreted. Thorax not strongly convex; metathoracic areae nearly all complete. Abdomen subfusiform, with the central segments rufescent-margined; petiole deplanate, with small lateral sulci; postpetiole hardly more than half the length of petiole, basally well discreted with subprominent spiracles and no lateral scrobes but a linear postspiracular impression; terebra exerted, one-third length of abdomen. Legs somewhat slender with the calcaria more or less unequal and not elongate; tarsal claws elongate and submutic. Wings with tegulae white; areolet small and petiolate, emitting the vertical recurrent nervure before its centre; radial cell somewhat broad and not elongate, with apical abscissa apically straight and hardly longer than the basal; nervellus oblique and subgeniculate.

The species are somewhat stout and not strongly compressed insects with the abdomen subnitidulous and centrally red-fasciated, a little allied to *Sagaritis* in having the clypeus slightly produced though by no means dentate, and the recurrent emitted before centre of areolet. Parfitt's species has not before been placed but, according to his own account, it should belong to the present genus.

Table of Species.

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| (2). | 1. | Larger and stouter; hind tibiae broadly flavidous | 1. VIENNENSIS, <i>Grav.</i> |
| (1). | 2. | Smaller and slenderer; hind tibiae rufescent or whitish. | |
| (4). | 3. | Scape entirely black; hind tibiae dull rufescent | 2. FUSCIPES, <i>Holmgr.</i> |
| (3). | 4. | Scape flavous beneath; hind tibiae centrally white | 3. AFFINIS, <i>Parf.</i> |

1. *Viennensis*, Grav.

Campoplex Viennensis, Gr. I.E. iii. 478, ♂ ♀. *Porizon annulator*, Zett. I.L. i. 394, excl. ♂. *Limneria Viennensis*, Holmgr. Sv. Ak. Handl. 1858, p. 57; Bridg.-Fitch, Entom. 1885, p. 106. *Ecphora Viennensis*, Thoms. O.E. xi. 1124, ♂ ♀.

Black with the central abdominal segments usually apically castaneous-margined, the legs partly pale with hind femora at most basally black; hind tibiae centrally broadly, and at their extreme base, stramineous; calcaria nearly equal in length; palpi and mandibles pale. Length, 7-8 mm.

In my females the centre of the black hind tibiae with their extreme base, and base of the posterior tarsi, are pure white and, although certainly co-specific, the areolet emits the recurrent before or beyond or from its centre.

Dahl sent Gravenhorst three Viennese specimens; Holmgren only knew Zetterstedt's single Lapland female; Gaulle records it as French, and Schm. considers it everywhere rare. Desvignes says in 1856 that Curtis possessed British examples; Fitch records it (Entom. 1883, p. 66) as doubtfully bred from *Gracilaria stigmatella*; and Bignell tells us in 1898 that he reared it on 21st June from a larva, probably that of *Sericoris littoralis*, found on *Armeria maritima* in Devon. I have several females, which I place here with some hesitancy because I cannot see the clypeal production; two were captured in Mr. Adams Lyndhurst fly-trap in June and July, a third was bred by J. A. Clark "from larvae of [*Plodia*] *interpunctella*," and the last I found on the flowers of *Angelica sylvestris* at the end of August, 1905, at Barton Mills in Suffolk. Piffard took males at Felden, Marshall has given me a female from Botusfleming in Cornwall and Cross bred a male from *Thera juniperata* in 1903; a pair occurred to me near Salisbury and others in the Isle of Wight during June. Rev. W. F. Johnson has taken many specimens of a small form of this species on Clare Island off the Mayo coast of Ireland.

2. *fuscipes*, Holmgr.

Campoplex fuscipes, Holmgr. Sv. Ak. Handl. 1854, p. 16, ♂. *Limneria fuscipes*, Holmgr. lib. cit. 1858, p. 66, ♂ ♀. *Ecphora fuscipes*, Thoms. O.E. xi. 1124, ♂ ♀.

A black species with the coxae, base of trochanters, base of all the femora and the hind ones mainly at least above, concolorous; remainder of legs somewhat dull red, with more or less of the second and third segments especially apically rather lighter red; calcaria nearly equal in length; palpi and mandibles pale. Length, 5-7 mm.

Instantly known from the next in its broadly red abdomen and concolorous hind tibiae.

Both sexes were first found rarely by Holmgren at Kullen in Sweden during July; it has been taken in France and twice in Belgium, but still seems very little known. Introduced as British at Proc. Nat. Hist. Glasgow, vol. iv., part 1, p. 108, but certainly rare with us. I first met with it on 6th and 16th August, 1901, at Lyndhurst in the New Forest; the

following year it occurred rarely on birch bushes in Assington Thicks in Suffolk during the middle of May, and I have subsequently taken it by sweeping at Tuddenham Fen, Market Rasen in Lincs., and in a sandy field at Brandon about 20th of June; there are a couple of Surrey females in Capron's collection. A form, which I can regard as nothing but one of this species was sent me by Dr. Chapman, who had reared it from *Pterophorus microdactylus*, on 13th March, 1904; it had emerged from its own semi-transparent and very pale orange-coloured cocoon, within that of its host in a stick; and differs from the typical form of this species (and all others at present placed in this genus) in having the hind femora, tibiae and tarsi entirely clear fulvous, with the joints of the last hardly subinfusate at their apices.

3. *affinis*, Parfitt.

Limneria affinis, Parf. Ent. Mo. Mag. xviii. 1882, p. 252, ♂ ♀.

A black species, with short whitish pilosity. Head transverse and densely punctate, buccate posteriorly, with mandibles and palpi stramineous, and apices of former ferrugineous. Antennae three-fourths as long as the body, black with the scape testaceous or flavous beneath. Thorax black and shagreened; metathorax coarsely punctate, with six areae divided by smooth and elevated costae. Abdomen elongate-clavate and subcompressed, with the segmental margins broadly dark testaceous, becoming apically evanescent; basal two-thirds of the first segment discally glabrous and nitidulous, its apex densely but superficially punctate, petiole parallel-sided, postpetiole abruptly explanate; second segment twice as long as broad, and about two-thirds longer than third segment; venter flavous; terebra testaceous, reflexed and 1 mm., or a fifth of the body, in length. Legs fulvous with the anterior onyches ferrugineous, their coxae and trochanters stramineous; hind coxae and trochanters black or, as are often their fulvous femora, discally black-marked; apical half of hind tarsi, with apices and base of their stramineous-white tibiae, black. Wings with tegulae stramineous; stigma dull white, or occasionally pale testaceous; areolet shortly petiolate, or occasionally sessile. Length, 5 mm.

"This insect in general appearance and colouring might, at first sight, be taken for a small specimen of Gravenhorst's *Campoplex Viennensis*; according to this author's arrangement, it would come in his second section, but naturally it would seem to be nearly allied to *C. Viennensis*, on which account I have named it *affinis*." (*loc. cit.*)

Parfitt possessed four examples; two swept from vetches in a field near Exeter during June, 1881, and two "bred from a hedge at Lydford, on the border of Dartmoor." No one has since noticed it (not excepting Bridgman in their 1885 revision of the genus), and I can reconcile it to none of my own specimens of the broad genus *Limneria*.

OMORGA, Thomson.

Thoms. O.E. xi. 1887, 1125.

Head posteriorly constricted and not triangular with genal costa little inflexed, sometimes sinuately continuous apically; lateral clypeal foveae small; mandibles not stout. Antennae with flagellum slender and scape infrequently pale beneath. Thorax subcylindrical and pronotum striate below; metathorax nearly always with costulae distinct and areola not transverse. Abdomen rarely broadly pale-marked; basal segment with no lateral sulci; postpetiole always broader and obviously shorter than petiole, usually ovate or laterally rounded, with no scrobes; second segment not shorter than broad, with no or obsolete thyridii; seventh of ♀ almost invariably not excised; terebra strongly exerted, usually about half-length of abdomen. Legs not stout with the hind femora not infrequently, and especially in the male, black or partly nigrescent; calcaria very often unequal and not elongate; unguiculi small. Wings with areolet small and distinct, usually irregular and petiolate; apical radial abscissa obviously longer than the basal; cubital nervure divergent; nervellus more or less distinctly oblique and usually geniculate below its centre.

The outline and elongate terebra of this genus resemble *Angitia*; it may be known therefrom by the oblique position of the usually geniculate nervellus, the lacking petiolar lateral sulci, discally convex and laterally rounded postpetiole; in the *mutabilis*-group of species, the metathorax is centrally excavate, as in *Limnerium* which does not possess the oblique nervellus, the posteriorly constricted head, nor ovate postpetiole of the present genus.

Table of Species.

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| (18). | 1. Abdomen, at least of ♀, dorsally black throughout. | |
| (11). | 2. Ventral plica infuscate; metathorax subexcavate. | |
| (4). | 3. Metathorax subrugose and distinctly excavate centrally | 1. MUTABILIS, <i>Hlmgr.</i> |
| (3). | 4. Metathorax smoother and not deeply excavate. | |
| (8). | 5. Scape always pale-marked beneath in both sexes. | |
| (7). | 6. Anterior trochanters pale; hind femora red | 2. FAUNUS, <i>Holmgr.</i> |
| (6). | 7. Anterior trochanters black; hind femora basally black | 3. MOLESTA, <i>Grav.</i> |
| (5). | 8. Scape not at all pale-marked beneath. | |
| (10). | 9. Hind femora and tibiae pale; ♀ segments 6 and 7 excised | 4. DIFFORMIS, <i>Gmel.</i> |
| (9). | 10. Hind femora basally and tibiae apically dark; nervelet distinct | 5. RAMIDULA, <i>Brisch.</i> |
| (2). | 11. Ventral plica stramineous; metathorax not excavate. | |
| (13). | 12. Hind femora red; stigma very pale | 6. OVATA, <i>Brisch.</i> |
| (12). | 13. Hind femora black; stigma darker. | |
| (15). | 14. Trochanterellus and centre of hind tibiae white | 7. BOREALIS, <i>Zett.</i> |
| (14). | 15. Trochanterellus and centre of tibiae not white. | |

- (17). 16. Second segment a third longer than apically broad; terebra half length of abdomen 8. CURSITANS, *Holmgr.*
 (16). 17. Second segment hardly longer than broad, nor terebra than first segment 9. LUGUBRINA, *Holmgr.*
 (1). 18. Abdomen, at least of ♀, red banded or marked towards anus.
 (20). 19. Genal costa sinuate; abdomen red, usually only basally black 10. MELANOSTICTA, *Grav.*
 (19). 20. Genal costa not sinuate; abdomen narrowly red.
 (24). 21. Segments two to seven only laterally red.
 (23). 22. Hind femora only basally and apically black 11. ENSATOR, *Grav.*
 (22). 23. Hind femora entirely black throughout 12. TUMIDULA, *Grav.*
 (21). 24. Segments two to seven at most only apically narrowly red.
 (26). 25. Apices of all segments, but first, narrowly red 13. MULTICINCTA, *Grav.*
 (25). 26. Apex of second segment alone narrowly red 14. FASCIATA, *Bridg.*

1. *mutabilis*, *Holmgr.*

Limneria mutabilis, *Holmgr.* Sv. Ak. Handl. 1858, p. 55; *Brisch. Schr. Nat. Ges. Danz.* 1880, p. 149 *et* 1890, p. 66; *Bridg.-Fitch, Entom.* 1885, p. 105, ♂ ♀. *Omorga mutabilis*, *Thoms. O.E.* xi. 1125, ♂ ♀. (?) *Campoplex lineolatus*, *Ratz. Ichn. d. Forst.* i. 93, ii. 82, iii. 84; *cf. Brisch. Schr. Nat. Ges. Danz.* 1880, p. 150, ♂ ♀.

A black species with abdomen immaculate and the femora and tibiae red, the hind ones at apex or base sometimes black; terebra hardly half as long as the strongly compressed abdomen. Head transverse and constricted posteriorly, with the frons subdeplanate and densely rugose-punctate, the palpi and usually centre of mandibles testaceous. Thorax with apical margin of mesosternum carinate, elevated and reflexed but not bilobed; metathorax somewhat coarsely subrugose and posteriorly distinctly excavate, with lateral areae discreted. Abdomen with only the ventral plica piceous; postpetiole strongly convex and laterally rounded; second segment longer than broad and third quadrate; terebra about half length of abdomen. Legs red, with coxae and posterior trochanters black; hind tibiae apically and also sometimes basally nigrescent, their tarsi infuscate. Wings with stigma dull testaceous and tegulae whitish; areolet petiolate and nervellus slightly geniculate. Length, 5-7 mm.

It is rendered distinct in the strong and subrugose metathoracic sculpture, unusually strongly narrowed vertex, often black mandibles, whitish tegulae, and the reflexed but simple mesosternal acetabulae. Thomson thought that perhaps Ratzeburg's species was a synonym of the present; but Brischke, who bred it from *Lophyrus pini* in addition to the original species of *Tortrix* and *Hyponomeuta* hosts, seems to have known them both and preserved their distinction.

O. mutabilis is of common occurrence in Swedish woods and gardens (*Holmgr.*); bred in Prussia from *Eupithacia pimpinellaria* pupa (*Brisch.*); in France from *Conchylis ambiguaella* (*Gaulle*); found at the Hague in June

(Burgst), and frequent in Belgium during May to July (Tosq.). In Britain it has been bred from *Ebulca sambucalis*, *Sciaphila virgaureana*, *Penthina gentianana*, *Notocelia Udmanniana* (Entom. 1881, p. 140); *Tortrix rosana*, a Tortricid larva on *Lithospermum*, *Grapholitha Paykulliana*, *Ephippiphora foenecana* (l.c. 1883, p. 66); *E. scutulana* or *E. Pflugiana* (l.c. 1884, p. 67); from *E. nigrocostana* on 19th May in Devon (Bignell); and very doubtfully from *Chrysophanus dispar* (E. M. M. 1903, p. 148). It is a common species about Norwich and, indeed throughout the country, though apparently rarer in the northern counties. I have it from Bristol, Bath and Taunton (Charbonnier), Malvern (Gorham), Chiswick (Sich), Milford Haven (Andrews), Tostock, Shere, Greenings; Whittle has bred the female at Southend from *Bacotia betulina* and Clutten from an unknown host at Burnley, both in July; on 10th July, 1901, I saw females sitting commonly on oak trunks, upon which were *Paedisca corticana* in abundance, in a wood at Oxshott in Surrey. Elsewhere it has occurred to me at Barton Mills, Bramford, Monk Soham, Southwold and Ashfield in Suffolk; Lyndhurst and Matley Bog in the New Forest; Newport in Isle of Wight; Boston and Louth in Linc., and very commonly at Ryde in my father's garden during August.

2. *Faunus*, Grav.

Campoplex maurus, Gr. I.E. iii. 516, ♂ (?). *C. Faunus*, Gr. lib. cit. 517, ♀. *Limneria Faunus*, Holmgr. Sv. Ak. Handl. 1858, p. 55; Brisch. Schr. Nat. Ges. Danz. 1880, p. 149; Bridg.-Fitch, Entom. 1885, p. 105, ♀. *Omorga Faunus*, Thoms. O.E. xi. 1126, ♂ ♀. Var. *O. submarginata*, Bridg. Trans. Ent. Soc. 1889, p. 423, ♂ ♀.

Black with femora and tibiae and anterior trochanters red, mouth and tegulae and ventral plica pale, and the underside of scape usually whitish; ♂ with anterior coxae also pale. Head transverse and somewhat constricted posteriorly, with palpi and mandibles except apically flavidous. Scape with a flavidous dot beneath. Metathorax somewhat more strongly excavate than in *O. difformis*, with its costae strong. Abdomen with only the ventral plica dull flavidous; postpetiole laterally rounded, and double breadth of petiole; second segment a little longer than broad, and third transverse; terebra rather more than half length of abdomen. Legs red with all the coxae except anterior of ♂, and only the hind trochanters black; hind tarsi infuscate. Wings subinfumate, with stigma piceous flavous and tegulae stramineous. Length, 5-7 mm.

The subexcavate metathorax, subinfumate wings and nearly angulated cubital nervure distinguish this species which, together with the two following, is recognised by having the mesopleurae not very closely though obviously punctate, the metathorax subexcavate and stout costae, the terebra almost longer than half abdomen, the nervellus evidently geniculate and ventral plica not nigrescent.

I propose to here treat *O. submarginata* as a variety of the present species, since its author himself was very uncertain of its right to specific rank, though it differs somewhat materially in having the scape, tegulae and mandibles immaculate black, and the hind tibiae darkly bicingulate: "Mr. Fletcher has bred three females and two males from *Eupithecia pygmaea* from Cambridgeshire."

O. Faunus is one of the commonest species of the genus on the Continent; Gravenhorst's single female was from Heldstedt at the end of July; not very frequent in central and southern Sweden (Holmgr.); bred from *Tortrix* pupa in Prussia (Brisch.); from *Ptocheuusa paupella* in France (Gaulle); and found in Belgium during June and July (Tosq.). In Britain it has only been bred from *Plutella porretella* by Elisha (Entom. 1883, p. 66); captured at Bickleigh in Devon at the end of August and very commonly in Norfolk.

The above hosts alone are known and the only bred specimens I possess were raised by Chapman from their own cylindrical black cocoons with central white girdle, the whole covered with a white spun down, 5 mm. in length, out of *Depressaria thapsiella* at Taormina in Sicily, during 1905. The perfect insect is, however, abundant in Britain, and I have it from Dover (Elliott), Dorking (Butler), West Runton in Norfolk (Wainwright), Guisbrough in Yorks (Roebuck), Coolmore in Donegal (Johnson), Kilmore in Ireland (Beaumont); Copthorne, Greenings and Shere in Surrey, Tostock, Bury St. Edmunds, Felden, Bristol, etc. It occurs throughout the late summer from early July to 27th September, when the female rarely comes to light after dark about 7.30 p.m.; it is found by sweeping and on country house windows, but by far the greater number is to be seen upon the flowers of fennel, angelica, Heraclum and more rarely on those of thistles (*Cnicus palustris*) and white-thorn, sometimes in quite high winds on the top of coast cliffs. I have taken a hundred at Shanklin in Isle of Wight, Lymington, Lyndhurst, Brockenhurst, Rhinefields and Hurst Hill in the New Forest, Huntingfield in Kent, Oxshott in Surrey, Kirtling in Camb., Ringstead in Norfolk and all over Suffolk.

3. *molesta*, Grav.

Campoplex molestus, Gr. I.E. iii. 518, ♀. *Omorga molesta*, Thoms, O.E. xi. 1126, ♂ ♀.

Black with the femora and tibiae red, and the posterior femora basally black; scape pale beneath. Head with the palpi and centre of mandibles testaceous. Thorax with mesopleurae not very closely, though obviously, punctate; metathorax subexcavate, with strong costae. Abdomen with only the ventral plica dull flavidous; postpetiole convex and laterally rounded; second segment hardly longer than broad; terebra a little longer than half abdomen. Legs red with coxae, trochanters and base of posterior femora black; hind tibiae apically and their tarsi infusate. Wings slightly clouded, with the stigma piceous flavous and tegulae whitish. Length, 6mm.

Very similar to *O. Faunus* and only to be distinguished by the basally black hind femora, and black anterior coxae and trochanters of both sexes.

Gravenhorst knew a single female from Piedmont, and Thomson both sexes from Gothland; I find no further Continental mention of it. This species was recorded as new to Britain by Bridgman (Entom. 1884, p. 70) on the strength of a breeding from *Ephippiphora scutulana* by Fletcher of Worthing; and it was subsequently confirmed as indigenous by its breeding by the same lepidopterist from *Catoptria fulvana* and its capture by Atmore at Kings Lynn in Norfolk. Half-a-dozen specimens in my

collection appear to belong to this species, though they differ from the last in little but the basally infusate hind femora and seem hardly more than a colour form of it. They were taken by Piffard at Felden in Herts, Capron about Shere in Surrey and the only male, whose anterior coxae and trochanters are black, was sucking the stylopods of *Angelica sylvestris* on 26th August, 1899, at Claydon bridge in Suffolk.

4. *difformis*, Gmel.

Ichneumon difformis, Gmel. S.N. 1790, 2720. *Campoplex difformis*, Gr. I.E. iii. 458; Ratz. Ichn. d. Forst. i. 92, ii. 81, iii. 82; Holmgr. Sv. Ak. Handl. 1854, p. 11, ♂ ♀. *Limneria difformis*, Holmgr. lib. cit. 1858, p. 58; Bridg.-Fitch, Entom. 1885, p. 106, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 149, ♂ ♀. *Omorga difformis*, Thoms. O.E. xi. 1127, ♂ ♀.

Black with the femora and tibiae red; ♀ with the sixth and seventh segments apically emarginate, ♂ with the anal valvulae mucronate. Body subnitidulous and finely grey-pubescent. Head hardly constricted posteriorly with cheeks subbuccate, palpi and centre of mandibles flavidous. Scape not pale-marked beneath. Thorax densely and rugosely punctate, with mesopleurae not very closely punctate; metathorax posteriorly longitudinally subexcavate, with stout costae and the areola apically incomplete. Abdomen with only the ventral plica flavidous; postpetiole laterally rounded, second segment a third longer than apically broad, third quadrate; terebra as long as hind tarsi and a little longer than half abdomen. Legs red with coxae and trochanters black, anterior trochanters partly pale; tarsi apically infusate. Wings somewhat infumate, with stigma piceous and tegulae whitish-flavous; areolet irregularly petiolate, emitting recurrent nervure beyond its centre; nervellus distinctly geniculate. Length, 5–9 mm.

The remarkable emarginate ♀ segments and mucronate ♂ anal styli, combined with the characters enumerated under *O. Faunus*, render this species unmistakable.

Sweden in July; Brischke bred it from a *Tortrix* pupa in Prussia; and it is said to be one of the commonest Continental species. Ratzeburg records his insect from *Tortrix Buoliana* (Jahresb. p. 268), in June from *T. ameriana* pupae (Wieg. Arch. ii, p. 40) and from *Bombyx dispar* (Bouché, Gartenins. 154); later (ii. 81) from *Nothris verbascella* and (at iii. 82) from *Tortrix laevigana*, *Psyche* sp. and *Noctua satellitia*, but more than one species must compose this medley; Gaulle considers it polyphagous on lepidoptera, as well as preying upon *Lophyrus pini* and *L. similis*; and Tosquinet found it during June in Belgium. This was the only species of "Campoplex" known to Westwood as British in 1840 (Introd. ii. Synop. 60). Bignell is said (Entom. 1881, p. 140) to have raised it from *Lomaspilis marginata*, but he tells us in 1898 that the Devon host from which it emerged on 8th May was unknown. Bridgman failed to note this species in Norfolk, and it has but rarely occurred to me in Suffolk on windows of Monk Soham House, in marshes at Reydon and on bushes towards the end of September at Depden, the highest point of the county (420 feet). Tuck took a female in Finborough Park at the end of August; Capron had both sexes from Shere; and Clarke bred a male from *Penthina cynosbana* on 7th July, 1907, at Crouch End near London. Between 3rd and 8th of July, 1904, Bankes bred a pair from *Tortrices* at Corfe Castle in Dorset.

5. *ramidula*, Brisch.

Limneria ramidula, Brisch. Schr. Nat. Ges. Danz. 1880, p. 155, ♂ ♀. *Omorgus ramidulus*, Schm. Opusc. Ich. 1709, ♂ ♀.

A dull black species, with the head not posteriorly constricted; palpi alone flavous. Antennae half length of body, with scape immaculate. Thorax longer than high; metathorax with five areae, of which the areola is broad, triangular and apically incomplete; petiolar area broad, longitudinally impressed and trans-rugose. Abdomen black with basal segment as long as hind coxae and trochanters, postpetiole convex and laterally rounded; second segment longer than broad, and third of ♀ transverse; terebra curved and half length of abdomen. Legs red, with coxae and trochanters black; trochanters of ♀ apically red; hind femora basally black, with their tarsi and apices of their tibiae infuscate. Wings with stigma nigrescent and the tegulae (presumably) black; radial nervure apically nearly straight; areolet petiolate and oblique, emitting recurrent nervure before its apex; nervelet short; basal nervure almost continuous; nervellus distinctly geniculate below its centre. Length, 5-7 mm.

Relegated by Schm. without comment to the present genus, where it appears to differ from *O. molesta* in little but its immaculate black scape and tegulae, since no mention of the latter is made by its author.

Both sexes were described in Prussia from males bred from *Nematus Valisnieri* larvae and females from *Retinia resinana* pupae. Atmore first found it to be British (Trans. Ent. Soc. 1886, p. 351) by breeding both sexes from *Retinia pinivorana* in June, 1885, at Kings Lynn; and subsequently Fletcher raised it from *R. buoliana*, probably at Worthing in Sussex.

6. *ovata*, Brisch.

Limneria ovata, Brisch. Schr. Nat. Ges. Danz. 1880, p. 151; Bridg.-Fitch, Entom. 1885, p. 106, ♀. *Omorgus ovatus*, Schm. Opusc. Ich. 1714, ♀.

Black and dull, densely and finely punctate. Head transverse and posteriorly constricted, with palpi and mandibles flavous. Antennae immaculate. Metathorax rugose with five distinct areae and costulae entire; petiolar area scarcely impressed. Abdomen black with postpetiole slightly convex, laterally rounded, with a superficial sulcus between spiracles; second segment little longer than broad and gradually explanate apically; third transverse and the following laterally compressed; terebra curved and fully half length of abdomen. Legs red with coxae and base of hind trochanters black; hind tarsi and extreme apex of their tibiae infuscate, with metatarsus nearly entirely red. Wings with stigma ochreous, radix and tegulae flavous; areolet petiolate, emitting recurrent nervure beyond its centre; radius apically straight; nervellus geniculate below its centre. Length, 7 mm. ♂ unknown.

The similarity of this species to *O. difformis* is remarked by Bridgman (Trans. Ent. Soc. 1884, p. 428) in introducing it as British; Bridg.-Fitch distinguish them by the transverse third segment of the present species, which has the stigma much paler; but no one has noted whether it possesses emarginate segmental apices.

Rare or overlooked. The female was described from Neuenburg by

Brischke, and has not again been found on the Continent. It was first taken with us by Dr. Capron at Shere and sent to Bridgman, but is not now in the former's collection. Bignell subsequently found it on 1st August at Oreston Quarry in Devon, and de la Garde has given me a ♀ he took in July, 1895, at Devonport.

7. *borealis*, Zett.

Porizon borealis, Zett. I.L. i. 395, ♀. *Limneria borealis*, Holmgr. Sv. Ak. Handl. 1858, p. 98; Brisch. Schr. Nat. Ges. Danz. 1880, p. 172, ♂ ♀. *Sagaritis borealis*, Tschek, Verh. z.-b. Ges. 1871, p. 53. *Omorga borealis*, Thoms. O.E. xi. 1129, ♂ ♀.

Black with the postpetiole subcircular, the anterior legs nearly entirely red, the hind ones white and black marked. Head large, buccate and not posteriorly constricted, with mandibles except apically and palpi whitish. Antennae with the scape rarely whitish beneath. Metathoracic areae distinct, with areola not transverse, and lateral areae discreted. Abdomen black with only ventral plica stramineous; basal segment somewhat shorter than coxae and trochanters, with postpetiole convex and laterally rounded; second segment a third longer than its apical breadth; terebra half length of abdomen. Legs with anterior femora and tibiae rufescent; hind legs and base of intermediate femora black; anterior trochanters, hind trochanterelli, with centre and extreme base of hind tibiae, white; metatarsus basally pale. Wings with stigma piceous and tegulae stramineous. Length, 4–5 mm.

A small species known by the front femora entirely, the intermediate except a basal black mark and their tibiae, fulvous; coxae black; anterior trochanters, hind trochanterelli with a basal band and centre broadly of their tibiae white; terebra half length of abdomen and the second segment not short.

Lapland and Sweden in July and August (Holmgr.), Prussia (Brisch.), Austria (Tschek), Belgium in July and August (Tosq.); bred in France from *Tischeria complanella* (Gaulle), and by Dr. Kreichbaumer from *Psyche* (*Apterona*) *Helix*, Sieb. (Thomson). The only record I can find is "Captured at Yelverton, 4th August" (Bignell, 1898, p. 492). It is a very distinct species in its black abdomen and hind femora, with their centrally dead white, not at all flavidous, hind tibiae and is locally very abundant with us. I have a hundred and fifty specimens. It is a spring and autumn species in my experience, occurring from April to 19th June, and from 9th August to 23rd September; at first it is to be beaten from thick spruce hedges, where perhaps it hibernates, and later found on umbelliferous flowers and by promiscuous sweeping; I possess it from Chatham in April, 1892 (Garde), Irvine Moor near Glasgow (Dalglish), Finborough Park and Bungay (Tuck), Shere (Capron), and Lyndhurst (Adams). I have found it in Suffolk at Burgh Castle, Bentley Woods, Tuddenham Fen, Elveden, on the banks of the Orwell at Ipswich in 1897, and abundantly on fennel flowers at Alderton and reeds about Southwold; elsewhere at Mablethorpe and Market Rasen in Lincs., Matley Bog in the New Forest and Clare Island on the west of Ireland. Banks has bred one batch containing nine of both sexes between 13th and 28th June from *Colcophora pyrrhulipennella*, Fisch., and another batch of about fifty, along with *Pezomachus* of both sexes and some small *Pimpla*

maculator, in the Isle of Purbeck; a male with three *Apanteles*, in July from *C. maniacella*, Stt., at Yarmouth in the Isle of Wight; fourteen between 5th and 19th July from Scots *Cataplectica aurumaculata*, Frey; a male in July from *C. troglodytella*, Dup., at Beddington in Surrey; and both sexes, with their somewhat smooth, cylindrical, dull flavous cocoon of 5 mm. with its central subcutaneous darker girdle, in May from larvae of *Chrysopora (Gelechia) stipella*, Hb., collected at Hayling Island in Hants, during the preceding November. Barrett bred seven from British *Retinia sylvestrana*; and Chapman a female from *Apterona crenulella* at Cannes, a male from *Coleophora* sp. at Zermatt in August and females, with male *Pezomachis*, from the same *A. crenulella* at Cava in Naples.

8. *cursitans*, Holmgr.

Limneria cursitans, Holmgr. Sv. Ak. Handl. 1858, p. 64, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 153, ♂; Bridg.-Fitch, Entom. 1885, p. 107. *Omorga cursitans*, Thoms. O.E. xi. 1129, ♀.

Head subbuccate and not posteriorly constricted; cheeks buccate, palpi and mandibles stramineous. Antennae longer than half body, with scape usually rufescent beneath. Thorax a little narrower than head, longer than high, with pleurae finely alutaceous and speculum nitidulous; metathorax gradually declived and not impressed, with areola longer than broad, apically incomplete and lateral areae discreted. Abdomen narrow and black, with only ventral plica stramineous; postpetiole convex, laterally rounded and almost double breadth of the slender petiole; second segment shagreened and nearly half as long again as broad; terebra a little longer than half abdomen. Legs with anterior femora and tibiae rufescent, their trochanters fulvidous; intermediate femora badius; hind femora nigrescent, their tibiae flavidous with both extremities infusate and trochanterellus fulvous; calcaria whitish and hind tarsi infusate, basally paler. Wings with stigma nigrescent and tegulae whitish; areolet petiolate, emitting recurrent nervure beyond centre; nervellus of ♀ subgeniculate below its centre, of ♂ entire. Length, about 5 mm.

Known by its black abdomen, hind calcaria extending to metatarsal centre, nigrescent stigma, pale mandibles and black anterior coxae; it is very like the next species but more slender with the head not narrowed behind, the second segment and terebra longer; perhaps also in the different pedal colouration, though I do not consider the last at all constant.

Holmgren considered the female very rare in Sweden, and Brischke took the male in Prussia; I find no other mention of this species, excepting Thomson's "Sällsynt." It was introduced as British on the strength of specimens taken not uncommonly in Norfolk during August and September by Bridgman (Entom. 1880, p. 53). Bignell subsequently bred it on 27th August from *Vanessa Atalanta* and captured it in early September at Exeter. It is by no means a common species with us, and my twenty specimens range through a dozen years' collecting, for the most part in sandy places. I have specimens from Cornworthy, Felden, Shere, Tostock and Benacre Broad; and have captured others on bushes at Barham and Henham Park, on *Heracleum* flowers at Coddensham and

Reydon, by beating trees at Brandon and flying to privet in Monks Soham garden, in Suffolk; as well as at Burwell Fen in Cambs.; on dates ranging from 27th May to 14th July. On 26th of the latter month I took in 1902 three males at the roots of grass on the Southwold sand-hills by the Suffolk coast, which all have the apices of their hind femora narrowly pale.

9. *lugubrina*, Holmgr.

Limneria lugubrina, Holmgr. Sv. Ak. Handl. 1858, p. 64; Bridg. Entom. 1880, p. 53; Brisch. Schr. Nat. Ges. Danz. 1880, p. 152; Bridg.-Fitch, Entom. 1885, p. 107, ♀. *Omorga lugubrina*, Thoms. O.E. xi. 1129, ♂ ♀.

Head somewhat constricted posteriorly; cheeks not buccate; mandibles except apically and palpi flavidous. Antennae a little longer than head and thorax. Thorax with pleurae subnitidulous and speculum glittering; metathorax hardly impressed with costae fine, areola apically incomplete and lateral areae discreted. Abdomen black, with only ventral plica stramineous; basal segment as long as coxae and trochanters, with postpetiole convex and laterally slightly rounded; second segment hardly longer than broad, and the following transverse; terebra but little longer than basal segment. Legs with anterior femora and tibiae red, hind tibiae flavidous with apex and a mark before base infusate; trochanterelli fulvous; hind femora, base of intermediate, and the hind tarsi except basally, nigrescent. Wings with stigma nigrescent and tegulae whitish; areolet shortly petiolate, emitting recurrent nervure beyond its centre. Length, 5-6 mm.

Very like the last species in its dark stigma, calcarial length, pale mandibles and dark hind femora, but differing in the finer metanotal costae, less buccate head, and the shorter second segment and terebra.

Sweden in July, Belgium in August and September, Prussia and France. There are few indigenous records: "On the 14th July last I gathered several flowering heads of wild carrot (*Daucus carota*) that I found growing on the tops of the cliffs, under the Plymouth Citadel, from which I bred, between 14th and 30th August, many *Oecophora flavimaculella*"—corrected to *Eidophasia messingiella* in 1898—"and its parasite *Limneria lugubrina*, Holmgr. Mr. Fitch named it for me and observed that it was new to Britain" (Bignell, Entom. 1880, p. 19); subsequently he captured it at Yelverton, early in August; and Bridgman, who found it at Earlham near Norwich in June, says Fletcher bred it also from *Gelechia naeviferella*, probably at Worthing. It is certainly no commoner than the last species with us, and I know it only from Felden and Shere (whence Capron mixed it with the last species), Nunton and Govilon in Monmouth (unnamed, ex. coll. Marshall); and Suffolk, where it occurs sparingly throughout the summer by sweeping, as well as on fennel, Heracleum and carrot flowers, at Blakenham, Alderton, Barton Mills, Westleton lamb pits, Claydon bridge and Needham Market. It was swept by me singly during June in Surlingham and Ranworth Broads in Norfolk, as well as at Cromer in August.

10. *melanosticta*, Grav.

Campoplex melanostictus, Gr. I.E. iii. 539, ♀. *Limneria melanosticta*, Holmgr. Sv. Ak. Handl. 1858, p. 70, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 163, ♂ ♀; Bridg.-Fitch, Entom. 1885, p. 206. *Omorga melanosticta*, Thoms. O.E. xi. 1132, ♂ ♀.

A black species with whitish pubescence, the stigma large and abdomen broadly red. Head hardly constricted posteriorly, with mandibles except apically and palpi stramineous; cheeks buccate. Antennae longer than half body, with scape usually testaceous beneath. Thorax with speculum glittering and anteriorly obliquely striate; metathorax finely rugulose with areola pentagonal, apically incomplete and lateral areae discreted. Abdomen with segments two to seven red with central discal black vittae of varying size, on all or only the apical segments; petiole always black, rarely with remainder of abdomen immaculate red; basal segment slightly longer than coxae and trochanters; post-petiole convex and laterally rounded, double breadth of petiole; second segment hardly longer than broad, and the following transverse; terebra as long as basal segment. Anterior legs red, basally black; hind ones black, with the tibiae very narrowly at their base and broadly in their centre testaceous. Wings with stigma triangular, broad and black, tegulae stramineous; areolet shortly petiolate and emitting recurrent nervure beyond its centre; nervellus very slightly geniculate below its centre. Length, 4-5 mm.

Our only species with broadly red abdomen, conspicuously large stigma and the genal costa sinuately continuous.

A single female was taken by Gravenhorst in Silesia during August, the same sex is rare in Sweden early in September; this insect has been found in Prussia and Belgium in May and July and bred, says Gaulle, from a species of *Incurvaria* in France. It has been recognised as British for forty years, yet the only mention I can find is its breeding by Parfitt (Entom. 1881, p. 140) from *Lampronia praelatella*, presumably in Devonshire. It must be extremely rare with us since the single example I have seen was swept in the open sedge fen at Wicken in Cambs, on 7th June, 1902.

11. *ensator*, Grav.

Campoplex ensator, Gr. I.E. iii. 576, ♂ ♀, excl. varr. 2 et 3; Tschek, Verh. z.-b. Ges. 1871, p. 65. *Limneria Ensator*, Holmgr. Sv. Ak. Handl. 1858, p. 72, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 163, ♂ ♀, cf. *lib. cit.* 1890, p. 66 et 1892, p. 45; Bridg.-Fitch, Entom. 1885, p. 207. *Omorga Ensator*, Thoms. O.E. xi. 1133, ♀.

Head not posteriorly constricted, with mandibles except apically and palpi whitish. Metathorax somewhat feebly impressed with lateral areae completely discreted. Abdomen with segments three to seven laterally red, and ventral plica stramineous; second segment little longer than broad; terebra somewhat longer than basal segment. Legs red with coxae, and both extremities of hind femora, black; anterior trochanters, hind trochanterelli, with extreme base and broad centre of hind tibiae, whitish; hind tibiae infusate at apex and before base. Wings with stigma piceous flavous, and tegulae whitish. Length, 5 mm.

Known by the colour of the legs, the strong lateral metanotal costae

and somewhat narrow postpetiole. I took an interesting pair on marram grass by the sea at Holme in Norfolk on 19th August, 1906, which differ from the typical form in their more nitidulous and subfusiform abdomen with apices of its central segments rufescent, in their much better defined and subparallel-sided metanotal areola, extremely obsolete alar areolet, shorter scapal pilosity and small size of only $4\frac{1}{2}$ mm.; I propose to term this form var. *psammae*, nov.

This species occurs in Italy and Germany in May and June, the female is infrequent in southern Sweden; it has been noted from Austria; Schm. says it preys upon *Grapholitha ocellana* and Giraud in 1877 upon *Thalpochara rosina*, probably in France whence Gaulle records it, as does Tosquinet in June and July in Belgium. It has long been known as British and was bred (Entom. 1883, p. 66) from *Hyponomeuta plumbella* and *Coleophora onosmella* by Elisha; it is very common in Norfolk and has been raised by Fletcher and Atmore from *Gelechia instabilella*, *notatella* and *proximella*, from *Phoxopteryx laetana*, *Grapholitha minutana* and *Lapronia quadripunctella* (Bridg.), to which Bignell adds *Butalis grandipennis* on 15th May in Devon. It is very frequently bred by lepidopterists, but is by no means common on the wing: Dorking in August (Butler), Oxshott in July (Beaumont), Shere (Capron), Co. Armagh (Johnson); I have met with it at Wroxham and Ranworth Broads in Norfolk, Wilverley in the New Forest and at Parkhurst Forest in I.W., during June; but only in the Reydon Marshes, by sweeping meadow-grass at Bramford and flying at *Chacrophyllum temulum* flower at Belstead from 4th June to 6th July, in Suffolk. A female was bred on 26th August from *Vanessa Atalanta* at Hanwell (Montgomery); several bred from Surrey *Pygid* cases in the middle of June and of September (Sich and Tonge); bred at Romsey in Hants on 8th March, 1884, from *Agrotis porphyrea* (Buckell); several of both sexes bred from their own very pale, unicolorous stramineous, fluffy, cylindrical cocoons of 5 mm., out of forced *Penthina dimidiata* at Medge Hall near Doncaster between 14th and 20th February, 1901, and captured there at Ashby on 30th May, 1900 (Dr. Cassal); both sexes bred in the Isle of Purbeck on 4th July from *Sericoris bifasciana*, Haw. (cf. Ichn. Brit. iii. 101); a dozen between 11th and 17th August, raised in Isle of Portland from *Luffia lapidella*, Goeze; and a male bred, along with several *Apanteles*, out of *Gelechia salicorniae*, Hrng., from Yarmouth in I.W., between 4th and end of August, 1896 (Bankes); Mr. H. J. Charbonnier has also sent me a male from Bristol, which he believed had emerged from *Sesia tipuliformis*, but this seems somewhat uncertain.

12. *tumidula*, Grav.

Campoplex tumidulus, Gr. I.E. iii. 594, ♀. *Limneria tumidula*, Bridg.-Fitch, Entom. 1885, p. 207, ♀. *Omorga tumidula*, Thoms. O.E. xi. 1133, ♀.

Head with the palpi and mandibles stramineous. Abdomen with segments three to six or seven laterally dark red, and apical margin of the segments also discally rufescent; terebra half length of abdomen. Anterior legs red, with coxae black, trochanters and part of tibiae flavidous; intermediate tibiae darker at both extremities; hind legs nigrescent, with centre of tibiae broadly and their base narrowly whitish; hind tarsi infusate, with metatarsi basally whitish. Wings with stigma piceous flavous and tegulae whitish. Length, 5–6 mm. ♂ ♀.

Very similar to the last species in size and colour, but the postpetiole broader with its sides dilated, and the hind femora entirely black. The ♂ has not hitherto been described; it differs from the ♀ only sexually.

Females on umbels during May and June in Germany (Grav.); Palsjo in Sweden (Thoms.), Belgium in July and August (Tosq.), and France (Gaulle). It was bred by Wheeler and Bridgman from *Glyphipteryx Haworthana* (Entom. 1881, p. 140); and respecting this emergence the latter wrote to Fitch in August, 1883, "There is little doubt but that *Limneriae* are very difficult to determine, still this is a striking species: I did breed a male of *L. tumidula*: I have a dozen specimens at least," which are now in the Norwich Castle Museum. It is said by Giraud to have been raised from such diverse hosts as *Coleophora laticella* by Loew and *Olibrus bicolor* by Heeger (Ann. Soc. Fr. 1877, p. 405). Bridgman, who later thought it possibly a variety of *O. ensator*, took one at Aylesham in Norfolk and Bignell found it early in August at Bickleigh in Devonshire. It seems very rare on the wing and I have only once taken a female, at Lyndhurst in the New Forest on 10th July, 1909; Capron had a dozen Surrey females, and Banks has given me one male, bred on 13th July, 1901, at Corfe Castle in Dorset from a larva of *Coleophora fuscescens*, Zell., and a dozen of both sexes between the 1st and middle of July, 1904, from the larval cases of *C. solitariella*, Zell., collected at Wareham in Dorset on the 28th of the preceding April.

13. *multicincta*, Grav.

Campoplex multicinctus, Gr. I.E. iii. 534, ♂ ♀; Ratz. Ichn. d. Forst. ii. 83, iii. 87. *Limneria multicincta*, Holmgr. Sv. Ak. Handl. 1858, p. 71; Brisch. Schr. Nat. Ges. Danz. 1880, p. 163; Bridg.-Fitch, Entom. 1885, p. 205, ♀. *Omorga multicincta*, Thoms. O.E. xi. 1134, ♂ ♀.

A black species with segmental apices and sides more broadly red, and the legs white and red marked, finely alutaceous and dull, with whitish pubescence. Head posteriorly constricted, with face strongly pubescent, palpi except apically and mandibles stramineous. Antennae slender and longer than head and thorax, with the scape rufescent flavous beneath. Metathorax finely rugose with the areola apically entirely wanting, but lateral areae discreted. Abdomen black with the second to seventh segments, and sometimes postpetiole, apically red; third to seventh laterally concolorous; often obsolete in ♂; ventral plica stramineous; basal segment as long as coxae and trochanters, with postpetiole convex, laterally rounded and double breadth of petiole; second segment a third longer than its apical breadth, and the third subquadrate; terebra somewhat longer than half abdomen. Anterior legs rufescent flavous with coxae basally black, tibiae externally and trochanters citrinous; hind coxae and trochanters black, the red femora usually partly infusate or nigrescent, tibiae whitish with a band before their base and their apices nigrescent, as are also their tarsi with white base. Wings with stigma piceous flavous and tegulae stramineous; areolet small and petiolate, emitting recurrent nervure beyond its centre, the radial apically straight and nervellus slightly geniculate below its centre. Length, 5-7 mm.

The pedal colouration is similar to that of *O. ensator*, but the segments are also apically pale on the disc, the areola is distinctly narrower and the ♂ abdomen has the rufescent colour often obsolete.

Both sexes were originally found on umbels in Germany; Ratzeburg's

records are not satisfactory, but (at iii. 256 *et* 9) he gives this species without query as parasitic on *Tinea populella* and with query on both *Nematus medullarius* and *N. pedunculi*; Boheman found the female in Sweden; Brischke bred it from *Earias clorana*, the "cocon im Gespinnste der Raupe steckend", in Prussia; Belgium, The Hague and France in June and July. Indigenous examples were said to be in the British Museum in 1850; Fitch bred it from *Alucitina polydactyla* (Entom. 1883, d. 66) and Giraud from an *Alucita* sur *Eryngium campestre* (1877, p. 404);



but neither Bridgman nor Bignell record it and we have no subsequent records, except that of Peter Cameron (Brit. Phyt. Hym. ii. 211), who gives it as parasitic upon *Euura pentandrae*. This is certainly a rare or rarely met with species and, besides a full series of both sexes from Shere, I have seen very few specimens: one female was bred on 5th July, 1903, from a batch of larvae of *Coleophora therinella*, Tgst., collected near Dartmouth during September, 1902, from which batch also emerged during 22nd–29th June, 1903, six female *Pezomachus instabilis*, Först. (cf. Ichn. Brit. ii. 228). I took several females and a male on *Heracleum* flowers about Lyndhurst in the New Forest during the first half of August, 1901; but have not seen it in Suffolk since taking a female on *Angelica* flower at Claydon Bridge in August, 1899.

14. *fasciata*, Bridg.

Limneria (Omorga) fasciata, Bridg. Trans. Ent. Soc. 1889, p. 422, ♂ ♀.

Head transverse and slightly constricted posteriorly, with the mandibles and palpi more or less pale. Antennae a little shorter than the

body, with scape pale beneath. Thorax with mesopleurae finely punctate below and speculum glittering; metathoracic costae very prominent, with lateral areae subdiscreted; areola pentagonal, about as long as broad and parallel-sided. Abdomen black with extreme apex of second segment distinctly but narrowly red, and ventral plica stramineous; postpetiole longer than broad, laterally slightly rounded in ♀ and nearly straight in ♂, longer and broader than petiole; second segment nearly a third longer than broad, and remainder transverse; terebra somewhat longer than a third of the abdomen. Anterior legs red with femoral base and coxae except sometimes apically black, and trochanters partly infusate; ♂ with anterior coxae flavous-marked beneath; hind legs black with apices of coxae and rarely most of femora red, their tibiae centrally and sometimes at extreme base ferruginous, as also is base of their tarsi. Wings with stigma infusate-testaceous and somewhat narrow, radix and tegulae stramineous; areolet petiolate, emitting recurrent nervure beyond its centre; nervellus antefurcal and slightly geniculate far below its centre. Length, about 5 mm.

This species has been nowhere noticed since first described.

"Bred by Mr. W. H. B. Fletcher from *Trycheris aurana* from Steyning, and *Psyche intermediella*, and also from either *Hysipetes ruberata* or *Grapholitha campoliliana* from Stornoway."—Bridg. l.c.

LATHROPLEX, Thomson.*

Thoms. O.E. xi. 1887, 1135.

Head with the vertex short, narrow and subtriangular; clypeus convex with its lateral foveae, the peristomium and mandibles small. Antennae with flagellum sometimes incrassate. Thorax subcylindrical; metathoracic areola elongate, emitting costulae before its centre. Abdomen with

*CALLIDORA, Thomson.

Thoms. O.E. xi. 1887, 1135.

Head anteriorly subtriangular, vertex short and narrow, eyes large; lateral clypeal foveae somewhat distinct; mandibles and peristomium small. Antennae of ♀ with flagellum white-banded above. Thorax elongate, with mesopleurae longitudinally rugose and speculum somewhat dull; metanotum with areae, the areola transverse with stout costulae. Abdominal petiole elongate and slender, with no lateral sulci; postpetiole suboval; second segment elongate with spiracles beyond its centre; terebra not exerted. Legs somewhat slender with fine and inequal calcaria, small unguiculi and claws. Wings with areolet large, broad and petiolate, emitting the subvertical recurrent nervure with its punctiform fenestra before centre; apex of discoidal cell broader than its base, and a little longer than the brachial cell; nervellus oblique and not or hardly geniculate.

Schmiedeknecht says the females of this genus are "easily recognised by the white-banded antennae; in this they remind one of the genus *Cynadusa*. In the males the white-band is wanting; they may be known by the large areolet and by the position of the recurrent nervure; thus they have a certain resemblance to many species of *Sagaritis*." Only two, probably synonymous, species are known.

I. albovincta, Holmgr.

Limneria albovincta, Holmgr. Sv. Ak. Handl. 1858, p. 56; Bridg.-Fitch, Entom. 1885, p. 105, ♀. *Callidora albovincta*, Thoms. O.E. xi. 1136, ♂ ♀.

Body finely rugose, dull, somewhat densely whitish pubescent. Black; palpi, labrum and mandibles except teeth pale yellow. Flagellum in ♀ with a broad white ring on inner side. Wings slightly clouded, stigma brownish, tegulae yellowish white. Anterior legs rufescent, trochanters and coxae paler, latter basally blackish; the hind legs have the coxae and base of trochanters black, femora rufescent, sometimes the extreme apex, very rarely also the base infusate; tibiae red-yellow, basally and apically infusate; tarsi dark brown. The incisure between segments two and three usually brown-red. Ventral fold pale yellow. Length, 6–7 mm.

I copy Schm.'s description of this species, which I do not know and of which he takes both sexes in Thuringia; it seems quite unknown elsewhere since it was first found by Prof. Wahlberg very rarely in Bohusia, Sweden. Our claim to it rests entirely upon the Rev. T. A. Marshall's record of a female (Ent. Ann. 1874, p. 143) "From the Dee-side marshes, Braemar. The antennae are semi-annulated with white." This specimen is now in the British Museum and I find it to be nothing but an ordinary female of *Cynadusa leucocera* (q.v. ante).

lateral petiolar sulci wanting, postpetiole often somewhat broad with no lateral scrobes; second segment basally alutaceous and evidently punctate; terebra short and subexserted, with spicula slender. Legs with the tibiae incrassate, calcaria short and both unguiculi and claws small. Wings with the radial cell elongate and somewhat broad, its apical abscissa at least twice as long as the basal; apex of discoidal cell hardly broader than its base, with its lower angle right; nervellus oblique and subgeniculate.

1. *infernalis*, Grav.

Mesoleptus infernalis, Gr. I.E. ii. 16, ♀; Ste. Illus. M. vii. 213. *Lathroplex infernalis*, Pfank. Zeits. Hym-Dip. 1906, p. 19, ♀.

Head immaculate. Antennae filiform and a little longer than half body, with flagellum not particularly stout. Thorax gibbous, with metathoracic areae indistinct; areola and petiolar area confluent. Abdomen oblong-ovate, clavate, a little longer and slightly narrower than head and thorax; basal segment gradually a little dilated apically, all the remainder subglaucous-margined; postpetiole distinctly broader than petiole and trifoveolate; second segment transverse; ventral plica citrinous; terebra stout and hardly exserted. Legs normal and black, front ones with tibiae and except basally femora red; posterior tibiae internally obsoletely testaceous. Wings hyaline and iridescent with the stigma, radix and tegulae stramineous; areolet regularly rhomboidal and petiolate, emitting recurrent nervure somewhat beyond its centre; apex of discoidal cell rectangular below. Length, 5 mm.

The type was taken by Bonelli during April in Piedmont. Stephens correctly identified his six specimens, now in Mus. Brit., which he "found near London in June, not common," with Gravenhorst's female. They certainly belong to the present genus (as I stated at Ichn. Brit. iv. 216), as set forth by Thomson; and the Italian type specimen was relegated to the same genus by Pfankuch. I have, however, heard of no indigenous records since 1835, except the female referred to under *Pyracmon obscuripes*, ante, and this is without data.

GONOTYPA, Thomson.

Thoms. O.E. xi. 1887, 1136; (?) *Gonotypus*, Först. Verh. pr. Rheinl. 1868, p. 153.

Head with the vertex broad, not at all constricted; cheeks subbuccate, the clypeal fovea, peristomium and mandibles small. Antennal flagellum elongate, slender and filiform. Thorax elongate and cylindrical; metathoracic areola short and triangular; costulae wanting. Abdomen strongly nitidulous and linear; basal segment short and stout with the petiolar glymmae distinct, and the indistinctly discreted and hardly broader postpetiole quadrate; second to seventh segments parallel-sided, gradually becoming more nitidulous apically with the seventh excised and in ♀ the third to seventh discally strongly emarginate; terebra reflexed, very stout and shorter than basal segment. Legs not stout; calcaria not elongate; tarsi slender with small and simple claws. Wings with areolet wanting; apical abscissa of radius distinctly longer than basal; both discoidal and brachial cells apically rubrectangular below; nervellus oblique and distinctly geniculate below its centre.

This genus is obviously allied to *Angitia insectator*, Schr., in the emargination of its anal segments and nitidulous abdomen, though at once known by its lack of areolet, geniculate nervellus and the very stout spicula, which is strongly impressed discally a little before its apex, with broad and apically obtuse valvulae.

1. *melanostoma*, Thoms.

Gonotypha melanostoma, Thoms. O.E. xi. 1137, ♂ ♀. *Gonotyphus melanostomus*, Schm. Opusc. Ichn. 1638, ♂ ♀.

A delicate, linear black and shining species, with the stigma broad and infusate though not black, the tegulae and radices pure white and in ♂ darker; both mesonotum and metathorax deplanate, with the areola continuous with petiolar area from apex to near base; legs dull luteous with tarsal apices, coxae, trochanters but not trochanterelli, and usually though not always the posterior with base of front femora, black; hind tibiae usually unicolorous, though more often subinfusate at apex and before base; upper half of recurrent nervure fenestrate. Length, 4–5 mm.

I only know the female of this species; it is very remarkable for having the third to seventh segments strongly emarginate discally, and the terebra both incrassate and discally incised shortly before its apex.

The species was described from Lund and Yddinge in Sweden; Schmiedeknecht, who simply copies Thomson's description, gives it a length of 5 to 6 mm., adding that he has taken several specimens in Blankenburg, always in dry clearings in woods. It has not before been noticed in Britain and cannot be of frequent occurrence with us, since I have seen only the five females in my own collection. One of these was taken by Capron, probably about Shere in Surrey twenty years ago; a second was captured by W. H. Tuck on 8th September, 1900, at Tostock in Suffolk; I swept two from reeds in a brackish ditch at Southwold on the coast, 11th September, 1907, and took another in Blythburgh Wood in the same neighbourhood on 14th September, 1912.

NEPIERA, Thomson.

Thoms. O.E. xi. 1887, 1137.

Head somewhat constricted behind the eyes with vertex not broad; clypeus apically truncate, with small lateral foveae. Antennae slender and filiform. Thorax elongate, with large white anteradical callosities; metathorax narrow and not convex with fine areae and obsolete costulae; areola strongly elongate, subpentagonal and apically incomplete. Abdomen cylindrical and parallel-sided in both sexes, multifasciate; petiole not short, with lateral sulci and scrobes distinct; spiracles of the strongly elongate second segment beyond its centre; terebra very shortly exerted, shorter than petiole. Wings with areolet small and hardly petiolate, emitting recurrent from or beyond its centre; recurrent nervure broadly and cubital narrowly fenestrate; nervellus oblique and hardly geniculate.

Superficially easily recognised by having every segment but the first apically narrowly pale, by the narrow form, large pale callosities and hardly exerted terebra. The markings somewhat resemble those of the Pimplid *Phidias aciculatus*, though the abdomen is here parallel-sided and narrow.

Table of Species.

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|------|----|---|-----------------------------|
| (2). | 1. | Areolet regular, intercepted centrally; hind tibiae black before base | 1. CONCINNA, <i>Holmgr.</i> |
| (1). | 2. | Areolet oblique, intercepted beyond centre; hind tibiae stramineous | 2. CLYPEATA, <i>Brisch.</i> |

1. *concinna*, *Holmgr.*

Limneria concinna, Holmgr. Sv. Ak. Handl. 1858, p. 84; Bridg.-Fitch, Entom. 1885, p. 207, ♂ ♀. *Nepiera concinna*, Thoms. O.E. xi. 1137, ♂ ♀.

A small black and densely pubescent species with the tegulae, radices, radical callosities, mouth and trochanters except base of hind ones, with centre and extreme base of hind tibiae, stramineous; legs and apical margin of all the segments apically pale, the hind coxae, basal joint of their trochanters with extreme base and apex of their femora black. Length, $4\frac{3}{4}$ – $6\frac{1}{2}$ mm.

Holmgren truly considered this species distinct from all his other *Limneria* in its pedal and abdominal colouration. The only Scots example I have seen is remarkable for having only the apices of the second, third and sixth segments pale, with the frenal carinae bright flavous; this female was captured by Elliott on 27th July, 1907, at Braemar.

It was considered by no means rare by its author in southern Sweden during July, and Thomson thought it distributed throughout north and central Europe, though Schm. says it is rare in Thuringia; Gaulle records it from France and Tosquinet found it in Belgium in July. With us it is abundant, though hitherto little known and not recognised till 1882, when Bridgman (Trans. Ent. Soc. p. 150) records it from about Norwich in August and Plymouth in the middle of July. In 1884, W. H. B. Fletcher bred it (Entom. xvii, p. 70) from *Gelechia notatella* at Worthing in Sussex; and in 1904 it was raised from Continental *Pterophorus microdactylus* by Chapman. I have about forty examples, captured by Marshall at Bishops Teignton, Yerbury at Barmouth towards the end of June, Butler near Guildford, Tuck at Benacre Broad in August, many at Shere by Capron, several at Felden by Piffard—who was so fortunate as to take one pair *in copula*—and on 24th June, 1910, a male emerged from its subcylindrical and unicolorous grey-brown cocoon of 5×2 mm., covered with loose strands, which Clutten had sent me from some Delamere Forest Lepidopteron; the right antenna of this specimen is normal, but the left aborted with only scape and basal flagellar joint entire and a tiny prominence extending from the latter. To me it has occurred most commonly during the first half of May and of September, though I have taken it in June, July and August, at Gosfield in Essex, Ringstead and Burnham Thorpe in Norfolk, Hastings in Sussex, Lyndhurst in the New Forest, Ryde in the Isle of Wight; it seems to have no predilection for the coast, but has occurred in Suffolk on fennel flowers at Alderton, and reeds at Easton Broad and Southwold in salt-marshes; it is hardly rarer inland on flowers of *Angelica sylvestris*, spruce in the spring and in hedges at Claydon bridge, Tuddenham Fen, Bramford and Elvedon.

2. *clypeata*, Brisch.

Limneria clypeata, Brisch. Schr. Nat. Ges. Danz. 1880, p. 171, ♂ ♀. *Nepiera clypeata*, Schm. Opusc. Ichn. 1732, ♂ ♀.

Black with the hind coxae concolorous, underside of scape and the legs stramineous with the hind femora and apices of abdominal segments fulvous; areolet oblique, emitting recurrent nervure beyond its centre. Length, 4 mm.

Extremely like the last species but certainly distinct in its posteriorly broader head, longer antennae with scape flavidous beneath, the more parallel-sided areola with costulae only basally traceable, stramineous legs with only the hind femora rufescent, hind coxae black and apices of their tibiae and tarsi subnigrescent, the paler stigma and oblique areolet, emitting recurrent very distinctly beyond its centre.

Both sexes were described from Prussian specimens bred from larvae of *Nematus Valisnieri* and a species of *Cryptocampus*, and it does not appear to have been since noticed. I possess a couple of males, described above, captured by the Rev. T. A. Marshall at Botusfleming near Hatt in Cornwall and bred on 18th August, 1903, by Tonge from an unknown Surrey host; and I captured a female at Mildenhall on 25th September, 1907, by sweeping reeds in a marsh.

TRANOSEMA, Thomson.

Thoms. O.E. xi. 1887, 1137.

Head short with the lateral clypeal foveae small. Thorax gibbulo-cylindrical, with mesopleural speculum shining or dull; metathorax smooth or rugosely punctate, with distinct costulae. Abdomen fusiform and black; petiole narrower and a little longer than the subquadrate postpetiole, with its lateral sulci and the latter's lateral scrobes distinct; second segment not longer than broad, with spiracles before its centre; terebra stout and exerted, at least as long as basal segment. Legs normal and red, basally black; not white-marked. Wings with the areolet distinct and irregular; nervellus oblique and hardly geniculate.

By no means a distinct genus, though it can only be confused with *Omorga* among those with oblique nervellus, and therefrom it is recognised by the possession of distinct lateral petiolar sulci and scrobes, subparallel-sided postpetiole, not elongate second segment with spiracles before its centre and the tibiae not white-marked.

Table of Species.

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| (2). | 1. | Postpetiole elongate, second segment not transverse | 1. ROBUSTA, Woldst. |
| (1). | 2. | Postpetiole quadrate; second segment transverse | 2. PEDELLA, Holmgr. |

1. *robusta*, Woldst.

Limneria robusta, Woldst. Bull. Acad. Petersb. 1876, p. 693; Bridg.-Fitch, Entom. 1885, p. 106, ♂ ♀. *Tranosema arenicola*, Thoms. O.E. xi. 1138, ♂ ♀.

A black species with whitish tegulae and red legs, with coxae except apices of the anterior black; abdomen strongly elongate, postpetiole

oblong-quadrate and the second segment not transverse; mesopleural speculum dull and metanotal carinae fine or obsolete; stigma subinfusate, face of ♀ apically subconstricted, clypeus convex, the peristomium small, thorax apically dull and punctate with no costae. Length, 6 mm.

Differs from our other species in its straight terebra, dull mesopleurae and more elongate postpetiole.

Described from Germany, recorded from France, and Thomson says his species ranges through north and central Europe; there can, I think, be no doubt respecting the synonymy, since the specimens found with us have antecentral spiracles in the second segment. It was brought forward as British by Bridgman (Trans. Ent. Soc. 1884, p. 428) on the strength of five females, now in my collection, taken by Capron in the neighbourhood of Shere and of others found by himself at Earlham in Norfolk. He adds that the colour resembles that of *Omorga difformis* and, like it, it has the nervellus geniculate; the metathorax has little more areae than the costulae connected by base of areola, forming a single transverse ridge; the third segment, though not the second, is transverse; and the terebra about half length of abdomen. Atmore has found it at Lynn in Norfolk (Bridg.) and it has occurred at Bickleigh in Devon on 1st July (Bignell). In Suffolk it is found upon the flowers of *Heracleum sphondylium* in July.

2. *pedella*, Holmgr.

Limneria pedella, Holmgr. Sv. Ak. Handl. 1858, p. 73; Brischke, Schr. Nat. Ges. Danz. 1880, p. 163, ♂ ♀. *Tranosema pedella*, Thoms. O.E. xi. 1138, ♂ ♀.

Black with the tegulae, mouth and legs red, trochanters stramineous, coxae black and the anterior apically pale; metathorax shining, subglabrous with areola apically entire; postpetiole quadrate, second segment transverse and speculum shining. Length, 5–6 mm.

Not uncommon in Sweden and through north and central Europe; Brischke bred it in Prussia from larvae of *Fenusa pumila* and a species of *Cryptocampus*. Both sexes of this species were taken by Bignell in Devon (Trans. Ent. Soc. 1886, p. 350) at Longbridge near Plymouth on 25th August (Trans. Devon Assoc. 1898, p. 492).

OLESICAMPA, Thomson.

Thoms. O.E. xi, 1887, 1139.

Head cubical and generally white-pilose, with the vertex broad and not posteriorly constricted; eyes internally entire; cheeks buccate, somewhat long with the costa inflexed; peristomium very broad; clypeus apically subtruncate with small lateral foveae; mandibles flavous, elongate and stout, apically not angular, with the lower tooth the longer. Antennal scape large and white beneath; flagellum elongate and, especially in ♀, apically pale. Thorax cylindrical and white-pilose, with pronotal epomiaae wanting and very rarely striate; metanotal costulae wanting; areola elongate, pentagonal and sometimes hardly indicated; petiolar area short. Abdomen subcylindrical and centrally nearly always more or less broadly red; basal segment laterally acute, with petiolar sulci nearly always distinct; postpetiole oblong and not broader than long, with

spiracles remote from the distinct lateral scrobes; second segment longer than broad, with thyridii obsolete; terebra not extending beyond anus. Legs red or fulvous and not slender, with the hind coxae always black and calcaria not extending beyond centre of metatarsus; the testaceous or dull red hind tibiae externally subsetose-spinulose and sometimes apically, though very rarely before their white base, nigrescent; claws somewhat elongate and at least basally pectinate. Wings with the stigma flavous and tegulae usually white; areolet not small, subsessile or very shortly petiolate, emitting recurrent nervure beyond its centre; radial cell not broad, apex of discoidal subacute below; cubital nervure not or hardly divergent, parallel emitted from centre of brachial cell; nervellus vertical and not geniculate.

It is especially distinct in its capital and mandibular structure, the apically pale antennae and entire nervellus. When erecting this genus, as sufficiently distinct from the remainder of Holmgren's *Limneria*, Thomson split off a large number of forms as good species; whether these will stand the test of a fuller investigation I am not prepared to say; to me the majority appear little more than colour and developmental varieties, of which I have seen four not hitherto known to occur with us, since no one has paid especial attention to the group in Britain.

Table of Species.

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|-------|--|-------------------------------|
| (2). | 1. Pronotum striolate; tegulae nigrescent; areola not long | 1. AUCTOR, <i>Grav.</i> |
| (1). | 2. Pronotum not striolate; tegulae white; areola elongate. | |
| (8). | 3. Larger; hind femora black; lateral petiolar sulci wanting. | |
| (5). | 4. Apex, not centre of abdomen, hind trochanters and cheeks pale .. | 2. GRACILIPES, <i>Thoms.</i> |
| (4). | 5. Centre, not apex of abdomen pale; hind trochanters partly and cheeks black. | |
| (7). | 6. First segment entirely, apex of hind tibiae hardly, black | 3. FULVIVENTRIS, <i>Gmel.</i> |
| (6). | 7. First segment apically red; hind tibiae broadly black | 4. BINOTATA, <i>Thoms.</i> |
| (3). | 8. Smaller; hind femora usually red; petiolar sulci basally strong. | |
| (16). | 9. Abdomen centrally broadly rufescent; terebra hardly exerted. | |
| (13). | 10. First segment apically, with all femora and tibiae, red. | |
| (12). | 11. Pilosity of body white; metathoracic areae indistinct | 5. LONGIPES, <i>Müll</i> |
| (11). | 12. Pilosity of body griseous; metathoracic areae strong | 6. PAGANA, <i>Holmgr.</i> |
| (10). | 13. First segment, with apices of hind tibiae, black. | |
| (15). | 14. Antennae elongate; hind femora red, only apically black | 7. NIGROPLICA, <i>Thoms.</i> |
| (14). | 15. Antennae short; hind femora entirely black throughout | 8. SIMPLEX, <i>Thoms.</i> |
| (9). | 16. Abdomen entirely black dorsally; terebra slightly exerted .. | 9. SERICEA, <i>Holmgr.</i> |

1. *auctor*, Grav.

Campoplex auctor, Gr. I.E. iii. 566, ♂ ♀. *Limneria auctor*, Holmgr. Sv. Ak. Handl. 1858, p. 95; Bridg.-Fitch, Entom. 1885, p. 207, ♂ ♀. *Olesicampa auctor*, Thoms. O.E. xi. 1140, ♂ ♀.

A black species with centre of abdomen and the legs red, their base and hind femora black or the latter centrally castaneous; mesopleurae nitidulous. Length, 7-9 mm.

The only species of the genus with nigrescent tegulae, striolate pronotum, and the metanotal areola not distinctly elongate.

Found on umbelliferous flowers in the middle of July in Germany; not common in Sweden and Lapland in August and at the end of June; Belgium in June and France; Brischke bred it (Schr. Nat. Ges. Danz. 1880, p. 166) from *Hadena suffuruncula* pupae. In Britain, Bignell captured it at Bickleigh on 17th August and 4th September; but it is very rare with us and I have only once taken it, on 1st June, 1904, between my fingers while it was hovering about a whitethorn hedge at Bramford in Suffolk.

2. *gracilipes*, Thoms.

Olesicampa gracilipes, Thoms. O.E. xi. 1143, ♂ ♀.

Black and densely silver-pubescent with the vertex not very broad, the flavous cheeks little buccate and the legs slender; abdomen black with its anus, and sides towards the anus, fulvidous and ventral plica stramineous; clypeus of ♂ apically, and of ♀ somewhat broadly, flavous; callosity before radices whitish; all the trochanters stramineous; antennae flavidous and basally nigrescent above. Length, 6-7 mm.

Very distinct in having the apices of the hind coxae and their whole trochanters and the cheeks pale, the apical half of the abdomen testaceous with a black discal vitta.

Described by Thomson from Scandinavia, and subsequently recorded by Gaulle from France. There is a beautiful female in my collection, captured some thirty years ago by Dr. Capron in the neighbourhood of Shere in Surrey.

3. *fulviventris*, Gmel.

Ichneumon fulviventris, Gmel. S.N. 1790, 2704. *Campoplex fulviventris*, Gr. I.E. iii. 540; Holmgr. Sv. Ak. Handl. 1854, p. 19, ♂ ♀. *Limneria fulviventris*, Holmgr. *lib. cit.* 1858, p. 86; Brisch. Schr. Nat. Ges. Danz. 1880, p. 165; Bridg.-Fitch, Entom. 1885, p. 206, ♂ ♀. *Olesicampa fulviventris*, Thoms. O.E. xi. 1140, ♂ ♀.

Black with the abdomen centrally broadly and most of the legs red; cheeks not excavate; lateral petiolar sulci wanting and spiracles far remote from their lateral scrobes; ventral plica pale; metathoracic carinae nearly wanting. Length, 8-9 mm.

Recognised from its allies by the subrectangular apex of discoidal cell, the curved apex of radial cell little longer than the basal abscissa, the dull mesopleural speculum, apically rugose-punctate metathorax and not apically black hind tibiae, which are but narrowly subinfusate.

Holmgren and Tosquinet noticed it from June to August in damp Swedish woods and Belgium; Gravenhorst found it in June in Germany,

and it is recorded from France. With us it is the commonest of the genus, and I have frequently met with it, though never in profusion, from 30th May to 2nd August. Capron had a long series from Shere, Piffard found a pair at Felden, Elliott took it at Skene in Scotland early in August, 1909, Marshall at Cornworthy, Saunders at Greenings, Chitty swept it at Huntingfield in Kent in 1903, and Adams has sent it me from Lyndhurst in July; it is recorded from near Norwich in May and June (Bridg.) and captured at Bickleigh during August, with three specimens



bred on 21st July from *Procris geryon*, in Devon (Bignell). In Suffolk I have found it at Brandon, Dunwich, Bentley Woods, and Monk Soham; in Cambridge at Wicken Fen; in Lincolnshire at Louth; in the New Forest at Rhinefields; and in Ireland at Louisburgh and Carramore Lake in Mayo.

4. *binotata*, Thoms.

Olesicampa binotata, Thoms. O.E. xi. 1141, ♂

Black with the centre of abdomen broadly, and the legs partly, red; hind femora black, cheeks excavate; lateral petiolar sulci wanting and their spiracles very remote from scrobes; ventral plica pale and metathoracic carinae nearly wanting. Length, 8 mm.

Similar to *O. fulviventris* in having the apices of the two basal segments, whole of the third and fourth, with part of the fifth, red; but the

apical radial abscissa is evidently longer than the basal and but slightly curved, the discoidal cell is apically subacute below, and the hind tibiae are more broadly, with apices of their femora distinctly, black.

Recorded from Aix, Belgium in July and France. It has not hitherto been noted in Britain but I possess it in Capron's Surrey collection, and expect it to occur not rarely here.

5. *longipes*, Müll.

Ichneumon longipes, Müll. Prodr. 1776, 159. *I. canescens*, Gmel. S.N. 1790, 2703. *Campoplex longipes*, Gr. I.E. iii. 549, ♂ ♀. *C. argentatus*, Ratz. Ichn. d. Forst. i. 96; ii. 83; iii. 87 (*nec* Grav.). *Limneria longipes*, Holmgr. Ofv. 1858, p. 326; Sv. Ak. Handl. 1858, p. 85, ♂ ♀. *Olesicampa longipes*, Thoms. O.E. xi. 1142, ♂ ♀.

Black with the abdomen, except both extremities, and most of the legs red; trochanterellus citrinous; ventral plica basally infuscate; postpetiole broadly red; head not posteriorly dilated; lateral petiolar sulci distinct. Length, 6–7 mm.

Known by the slightly constricted temples, pale anteradical callosities, somewhat distinct metanotal areae, narrow radial and apically acute discoidal cell, the immaculate red tibiae and femora, and flavous anterior coxae.

It occurs very commonly in central Europe on umbelliferae in August, not infrequently in marshy places throughout Sweden, and in France; Ratzeburg records his species from *Lophyrus pini*, *rufus*, *pallidus* and *similis*; and Brischke bred it (1880, p. 165) from *Nematus perspicillaris*. In Britain it is also very common; Norwich and Kings Lynn in July (Bridg.), Plym Bridge on 21st September (Bignell), Greenings in July (Saunders), Taunton in August (Charbonnier), Tostock and Bury St. Edmunds in July (Tuck), New Forest in July (Adams), several at Skene in Scotland in August (Elliott). I have found it on flowers of *Foeniculum vulgare* at Ringstead in Norfolk in August, at Chippenham Fen in Cambs. in June, in Tuddenham Fen and on Clare Island off the west coast of Ireland, where Rev. W. F. Johnson takes the species in Armagh.

6. *pagana*, Holmgr.

Limneria pagana, Holmgr. Sv. Ak. Handl. 1858, p. 86, ♂ ♀. *Olesicampa pagana*, Thoms. O.E. xi. 1142, ♀. Var. *L. consobrina*, Holmgr. *lib. cit.* p. 87, ♂ ♀.

Black with the abdomen broadly in the centre, and most of the legs, red; trochanterellus also red; ventral plica basally infuscate; postpetiole broadly red; head not posteriorly dilated; lateral petiolar sulci distinct. Length, 5–6 mm.

Very like *O. longipes* but much smaller with the mandibular teeth less stout, the fifth segment black and the second but little longer than broad, flagellum black becoming rufescent towards its apex, the anteradical callosities not white and the head a little narrower behind the eyes, says Thomson who seems to have reconstructed rather than recognised this species; Holmgren considered it very similar to the last species, *at sine dubio diversa*, especially in the cinereous and not white pubescence, the

subequally long mandibular teeth, the strongly complete five metanotal areae and darker legs.

Originally found in marshy places in northern Sweden and southern Lapland from June to August, and apparently not detected elsewhere till it was incorporated as British in Bridg.-Fitch's table of *Limmeria* (Entom. 1885, p. 206), and recorded both by the former from Earham near Norwich in June in 1894 and by Bignell in June from Bickleigh in Devon in 1898. The only British mention I find of *L. consobrina*, which was thought probably a form of the present species by its author and may be here so treated since no one has reviewed it, is by Bridgman (Trans. Norf. Soc. 1894, p. 620), who took it at Eaton near Norwich in July, and considered it to be a good species.

7. *nigroplica*, Thoms.

Olesicampe nigroplica, Thoms. O.E. xi. 1143, ♂ ♀.

Black with the abdomen centrally, its postpetiole and most of the legs rufescent; hind trochanterellus, femoral apices, tarsi and tibiae black, the centre of the last ferrugineous and base of metatarsi whitish; ventral plica basally infusate; head not posteriorly dilated; lateral petiolar sulci distinct. Length, 8-9 mm.

A large species and similar to *O. fulviventris*, but with the ventral plica nigrescent and the petiolar sulci distinct. The broadly black apices of both hind femora and tibiae are conspicuous.

North and central Germany, Belgium in August, and France. Not previously noted in Britain; I have both sexes in Capron's collection from Shere in Surrey, a female taken at Greenings in the same county during June, 1871, by Wilson Saunders, and myself swept the male near Ipswich in 1894.

8. *simplex*, Thoms.

Olesicampe simplex, Thoms. O.E. xi. 1147, ♂ ♀.

A black species, with the abdomen centrally somewhat narrowly red-banded; anterior legs flavous with their base stramineous, the hind ones black with trochanterellus, tibiae and tarsi testaceous and apically broadly black; postpetiole and second segment evidently longer than broad; hind trochanterellus simple. Length, 7-8 mm.

Known by the vertex being a little narrowed in both sexes, the meta-thorax not rugose but with well delineated carinae, the areola apically constricted, the discoidal cell apically acute and hind trochanterellus simple.

Sweden, France, Belgium in June and July, and frequent in Thuringia. By no means uncommon with us from 20th May to 20th June, though not hitherto noticed here. Adams has sent me examples from Lyndhurst in the New Forest, Marshall from Cornworthy in Devon, and Tuck from Tostock and Bungay in Suffolk, in which county I have taken it on the banks of the Alde at Farnham and in the marshes about Brandon, usually in early June.

9. *sericea*, Holmgr.

Campoplex nigratarsus, Gr. I.E. iii. 506; *Linneria nigratarsa*, Woldst. Bull. Ac. Acad. Petersb. 1876, p. 393; Brisch. Schr. Ges. Danz. 1880, p. 150; Bridg.-Fitch, Entom. 1885, p. 107, ♂ (?). *C. Consumtor*, Gr. I.E. iii. 515; *L. Consumtor*, Brisch. Schr. Ges. Danz. 1892, p. 21, ♂ ♀ (?). *C. maurus*, Gr. I.E. iii. 516, ♂ (?). *C. sericeus*, Holmgr. Sv. Ak. Handl. 1854, p. 15, ♀. *Linneria sericea*, Holmgr. *lib. cit.* 1858, p. 88; Bridg.-Fitch, Entom. 1885, p. 107, ♂ ♀ (*nec* Prov.). *Olesicampa sericea*, Thoms. O.E. xi. 1141, ♂ ♀.

Entirely black with only the femora and tibiae red, and the hind tibiae apically with ventral plica nigrescent; lateral petiolar sulci distinct. Length, 6-7 mm.

Only one other species, and that not British, has the whole abdomen black above.

Probably much mixed with other kinds of these difficult genera. Holmgren took several specimens in Scandinavia in July and August; France (Gaulle); and Belgium in August (Tosquinet). Bignell took it at Bickleigh early in August; and I possess several Surrey females in Capron's collection, with one found in Bentley Woods on hazel along with *O. fulviventris* in the middle of July, 1902, and one beaten from birch in Tuddenham Fen early in the following June.

MELOBORIS, Holmgr.

Holmgr. Ofv. 1858, p. 326; Sv. Ak. Handl. 1858, p. 96.

Head buccate with vertex broad and nearly cubical; face of ♀ narrower than frons, and sometimes constricted towards the mouth; eyes not internally emarginate; cheeks subbuccate, somewhat short with costa inflexed; peristomium not large; mandibles not very stout and hardly constricted towards apices, with the teeth of equal length; clypeus apically broadly rounded with the lateral foveae small. Antennal flagellum elongate, and the scape black or rufescent beneath. Thorax elongate and cylindrical with pronotum not striolate, and epicnemia extending nearly to callosities; mesosternum subquadrate or longer than broad; metathorax with distinct and usually complete areae, stout carinae, the areola subpentagonal and emitting strong costulae before its centre. Abdomen dorsally subparallel-sided and nearly cylindrical, at least centrally and sometimes also apically red; basal segment stout, slightly curved and a little longer than hind coxae, with lateral petiolar sulci distinct; postpetiole evidently broader and a little shorter, subquadrate, with distinct lateral scrobes; seventh segment exerted and in ♀ often incised; valvulae of ♂ usually large and apically rounded; terebra always reflexed, hardly exerted or nearly half length of abdomen. Legs normal and red, with at most their coxae and trochanters black; tibiae neither pale-banded nor externally spinulose; calcaria hardly reaching metatarsal centre; claws and unguituli mutic and stout. Wings with tegulae pale; radial cell narrow, equally curved at both extremities and hardly angled centrally below; areolet usually distinct and petiolate; apex of discoidal cell acute below; brachial cell usually emitting anal nervure below its centre; nervellus neither oblique nor geniculate.

It may be superficially recognised by the cylindrical body, broad head, long and often a little stout antennae, and mainly or nearly entirely red abdomen and legs; the facies are quite distinct from *Olesicampa*, which has stouter and unequal mandibles. Schmiedeknecht has served no good purpose in removing *M. dorsalis* to *Zaporus*, Först., on account of its lacking areolet, and *M. crassicornis* to *Diadegma*, which typeless genus of Förster he uses entirely differently from my application of it (Ichn. Brit. iii. 274), on account of its centrally unangled radius which differs in no way from that of other *Meloboris* species.

Table of Species.

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| (2). | 1. Areolet wanting; petiolar area extending beyond centre | 1. DORSALIS, <i>Grav.</i> |
| (1). | 2. Areolet entire; petiolar area not extending beyond metathoracic centre. | |
| (4). | 3. Brachial cell apically rectangular below; ♀ face constricted | 2. STAGNALIS, <i>Holmgr.</i> |
| (3). | 4. Brachial cell apically acute below; ♀ face parallel-sided. | |
| (10). | 5. All the coxae pale, hind ones alone rarely black. | |
| (7). | 6. Terebra not longer than anus; anterior coxae red | 3. INCULCATOR, <i>Grav.</i> |
| (6). | 7. Terebra nearly half abdominal length; anterior coxae usually flavous. | |
| (9). | 8. Postpetiole longer than broad; metathorax not rugose | 4. RUFIVENTRIS, <i>Grav.</i> |
| (8). | 9. Postpetiole quadrate; metathorax apically rugose | 5. LITORALIS, <i>Holmgr.</i> |
| (5). | 10. All the coxae, and hind trochanters black. | |
| (12). | 11. Flagellum long and slender; areolet broad; smaller | 6. ISCHNOCERA, <i>Thoms.</i> |
| (11). | 12. Flagellum short and stout; areolet narrow; larger | 7. CRASSICORNIS, <i>Grav.</i> |

1. *dorsalis*, *Grav.*

Campoplex dorsalis, Gr. I.E. iii. 528; Holmgr. Sv. Ak. Handl. 1854, p. 21, ♂. *Limneria dorsalis*, Holmgr. lib. cit. 1858, p. 96; Bridg.-Fitch, Entom. 1885, p. 105, ♂ ♀. *Meloboris dorsalis*, Thoms. O.E. xi. 1149, ♂ ♀.

A black species with the deplanate postpetiole and transverse second and third segments castaneous; legs unicolorous red throughout; areolet wanting; thorax pilose with the petiolar area extending beyond centre of metathorax; lower basal nervure oblique and postfurcal; terebra somewhat longer than basal segment. Length, 7–8 mm.

The only known species with no areolet.

It is of uncommon occurrence in Prussia, Sweden, France and Belgium in July and August. Bridgman found it in Heigham osier carr and at Horning Ferry in the Norfolk Broads during June and August; and it is certainly rare with us, since my single male was swept from a weedy ditch at East Bridge, near the Suffolk coast, so long ago as the 10th July, 1900.

2. *stagnalis*, Holmgr.

Campoplex stagnalis, Holmgr. Sv. Ak. Handl. 1854, p. 34, ♂ ♀. *Meloboris stagnalis*, Holmgr. *lib. cit.* 1858, p. 101; Thoms. O.E. xi. 1149, ♂ ♀.

A black species with the legs and abdomen bright red, the basal segment and part of hind coxae black; abdomen strongly convex with petiole and second segment short; antennae longer than half body with flagellum very slender and underside of scape red; brachial cell short and externally subrectangular below; thyridii large, seventh segment of ♀ excised, ♂ with anal valvulae large. Length, 5–7 mm.

A small species with the petiole short, postpetiole transversely subquadrate; radius equally curved in both abscissae and emitted beyond centre of the flavous stigma, areolet regular and emitting the recurrent from its centre; hind coxae basally black, cheeks short and not buccate, and the ♀ face apically constricted.

I have no doubt that this is the *Limneria hydropota* recorded from Brundall in July by Bridgman, though that species may also occur with us and is at once known by the irregular areolet emitting the recurrent nervure far beyond its centre. I have three females, captured at Guildford by Butler, by Capron at Shere and by myself in the middle of June, 1901, by sweeping rank herbage in Rockland Broad, Norfolk. Abroad I can find no records outside Sweden, where Holmgren found it to be infrequent.

3. *inculcator*, Grav.

Ichneumon sagittarius, Müll. Prodr. 1776, 159 (?). *Campoplex inculcator*, Gr. I.E. iii. 553; Blanch. Hist. Nat. Ins. 1840, 324, ♀. *Limneria paludicola*, Holmgr. Sv. Ak. Handl. 1858, p. 88; Bridg.-Fitch, Entom. 1885, p. 205, ♂ ♀. *Meloboris inculcator*, Thoms. O.E. xi. 1150, ♂ ♀. Var. *Campoplex insidiator*, Gr. I.E. iii. 562, ♂ ♀.

Black with the abdomen except basally and legs red; terebra not extending beyond anus; anterior coxae red; face parallel-sided; apex of brachial cell acute below; antennae but little longer than half body, with flagellum attenuate; thyridii obsolete and the ♂ anal valvulae normal. Length, 6–7 mm.

This species, as I understand it, has much the facies of *Phobocampa*, though with the vertex much broader, the nervellus vertical and hind tibiae not white. I find Dr. Capron has placed a pair under the name *Limneria insidiator* in his collection, which differ in little but their infusate anus; this name has not been revived since given to two central European insects by Gravenhorst in 1829 and the present synonymy appears correct as far as one can judge from his description.

Limneria paludicola was known as British to Marshall in 1870; it is recorded from Felthorpe in Norfolk during June by Bridgman, who does not appear to have known *L. insidiator*, though Bignell on the contrary gives the latter alone as occurring at Plym Bridge and Bickleigh in August. I have typical females from Bolt Head (Marshall), Shere (Capron), Wicken Fen in Cambs and Bentley Woods near Ipswich in June, and on *Heracleum* flowers near Milton in Hants at the end of July; both sexes of the var. *insidiator* occurred on marsh plants with the typical form at Wicken and the Bentley Woods, as well as at Barton Mills,

Blythburgh on oak, Tuddenham Fen, Barnby Broad, Stanstead, Mildenhall and Brandon in Suffolk, and in the New Forest, during June and August; Marshall took it at Govilon, Atmore at King's Lynn, and Capron at Shere.

4. *rufiventris*, Grav.

Campoplex rufiventris, Gr. I.E. iii. 552; Holmgr. Sv. Ak. Handl. 1854, p. 20, ♂ ♀. *Limneria rufiventris*, Holmgr. lib. cit. 1858, p. 68; Bridg.-Fitch, Entom. 1885, p. 205, ♂ ♀. *Meloboris rufiventris*, Thoms. O.E. xi. 1150, ♂ ♀.

A black species with the sericeous and somewhat dull abdomen and the legs entirely red, only the petiole and ♂ anus being usually narrowly nigrescent; terebra nearly half length of abdomen; anterior trochanters usually flavous; seventh segment of ♀ centrally incised. Length, 5-7½ mm.

At once known by the almost totally red abdomen, the always sub-elongate postpetiole, clear testaceous stigma, usually red underside of the scape and not apically rugose metathorax with its slender costulae.

This is a sufficiently common species throughout north and central Europe, though not recorded from France; it has been bred by Brischke in Prussia from pupae of *Orthotaelia Sparganiella* and he says the cocoon is elongate cylindrical and flavidous grey-brown. With us there are few records, but though decidedly local it is abundant wherever it occurs, especially in the virgin bog of the New Forest and the salt marshes of the Suffolk coast, in both of which localities I have seen it without fail for the last ten years. Bridgman found it at Eaton, Brundall and Heigham in Norfolk during July and August, and I met with it at Hickling there in June; it is first seen about the middle of June and then in the male sex only, for I have seen no female before July, from which time both sexes are met with up to 18th September, always in marshes and usually upon reeds. I have fifty examples from Delamere Forest (Tomlin), Tostock and Finborough Park (Tuck), Kilmore in Ireland (Beaumont) and St. Kilda in June, 1905 (Waterston); it has occurred to me on Clare Island and the adjacent mainland of Ireland; at Salisbury and in the New Forest at Denny Bog, Matley Bog and Setley; in Suffolk it appears restricted to the banks of the Gipping at Ipswich where it has been swept at dusk, Henstead Marsh and the Southwold salt-marshes, where it annually abounds with *M. crassicornis*.

5. *litoralis*, Holmgr.

Campoplex litoralis, Holmgr. Sv. Ak. Handl. 1854, p. 20, ♂ ♀. *Limneria litoralis*, Holmgr. lib. cit. 1858, p. 69; Bridg.-Fitch, Entom. 1885, p. 205. *Meloboris litoralis*, Thoms. O.E. xi. 1150, ♂ ♀.

A black species with the abdomen centrally broadly, and the legs entirely red; the areola and postpetiole quadrate; terebra nearly half length of abdomen. Length, 6-8 mm.

Very like *M. rufiventris* and much mixed with it on the Continent, but with the metathorax apically somewhat strongly rugose, the costulae stouter, both metanotal areola and the postpetiole not longer than broad, and the stigma distinctly infusate testaceous, the whole structure stouter and the anus determinately black.

Holmgren says it occurs in marshy places on the banks of lakes and rivers throughout Sweden, but it does not seem to have been recorded elsewhere. The only mention of it in Britain is the exhibition of an example from Woking (Meeting Ent. Soc. 7th Sept. 1881), where it was found on 1st August. I possess but four males and two females, all swept in the most marshy spots on the Norfolk and Suffolk coast, upon reeds growing in brackish water at Southwold thrice, at Holme on *Statice limonium*, investigating a salt-marsh plant at Aldeburgh, and once in Barnby Broad near Lowestoft during June, July and August.

6. *ischnocera*, Thoms.

Meloboris ischnocera, Thoms. O.E. xi. 1151, ♂ ♀.

Black with the abdomen centrally and the legs red, with all the coxae and the hind trochanters black; seventh segment of ♀ subincised and terebra nearly half length of abdomen. Length, 5 mm.

The antennae are black, with flagellum filiform and slender, calcaria small, areolet broad, cheeks subbuccate, pleurae hardly punctulate, all the coxae and hind trochanters black, abdomen with the third segment entirely, the second except its base and part of the fourth, red.

It was described from Lund and is not uncommon on the Continent, where Gaulle has found it in France and Tosquinet during June and July in Belgium. It was, therefore, likely to occur with us and Capron correctly named several females and a male in his Surrey collection; I took an analogous male by sweeping in Tuddenham Fen in June, 1908, and in the middle of the following August found another on marram grass on the Lowestoft denes in northern Suffolk.

7. *crassicornis*, Grav.

Campoplex crassicornis, Gr. I.E. iii. 565, ♀; Boie, Weigm. Arch. 1836, ♂ ♀. *Limneria crassicornis*, Holmgr. Sv. Ak. Handl. 1858, p. 67, ♀; Marsh. Ent. Ann. 1874, p. 143, ♂; Brisch. Schr. Nat. Ges. Danz. 1880, p. 163; Bridg.-Fitch, Entom. 1885, p. 206, ♂ ♀. *Meloboris crassicornis*, Thoms. O.E. xi. 1151, ♂ ♀.

A black species with the centre of the abdomen broadly and the legs red; all the coxae and the hind trochanters black with hind tarsi apically infusate, mesopleurae somewhat closely punctate and areolet small; mandibles black or ferrugineous; antennae hardly longer than half body, terebra nearly half length of abdomen, and calcaria somewhat elongate. Length, 5–10 mm.

At once known by the entirely black coxae and stout antennae.

Hope sent this species from Netley to Gravenhorst, who knew it from Germany, France and Hungary, and it is not rare in Sweden; Brischke bred it in Prussia from *Hadena suffuruncula*; he is said by Dalla Torre to have also raised it from *Nematus Vallisnerii*; and Gaulle gives *Nonagria typhae* as another host. There are few British records; Marshall found it on the banks of the canal near Leicester (Ent. Ann. 1874, p. 143) and Bignell at Bickleigh during May and August. Both sexes are recorded, probably erroneously, from *Oxyptilus leucii* (Proc. S. Lond. Ent. Soc. 1896, p. 86); but its more probable hosts are such noctuae as *Leucania lithargyria*, whence Parfitt bred it (Entom. 1881, p. 140); and to which Bridgman, who took it at Earlham near Norwich, adds (Trans. Norf. Soc. 1894, p. 620) *Plusia interrogationis* and *Grapholitha campoliana*.

These meagre details by no means represent the abundance of this species in Britain. It is to be frequently met with throughout the summer from the 5th May to the 1st October on umbelliferous and other flowers, such as *Cicula virosa*, *Heracleum sphondylium*, *Chacrophylum sylvestre* and *Statice limonium*, as well as bracken, reeds and rushes, whence it is most frequently swept in marshy situations, though by means confined to them, for the long grass along the side of a dusty high road will often produce this insect, and it sometimes occurs at dusk. I have examples from Tostock and Finborough Park (Tuck), Timworth in Suffolk (Nurse); Guildford (Butler), Woking (Morice), Shere (Capron), Greenings and Cophthorne (Saunders) and Grayshott (Elliott) in Surrey; Felden (Piffard); Chatham (Garde) and Blackheath (Beaumont) in Kent; Hunstanton (Brunetti) and King's Lynn (Atmore); Botusfleming, Nunton, Bishops Teignton and Govilon in Wales (Marshall). Lake Nemocka in Mayo (Halbert), Waterville in Ireland (Yerbury); Armagh and Co. Down (Johnson). Kings Cross in Arran and Kenmare (Dalglish), Aberlady (Yerbury), Banchory, Park, Braemar, Fincean and Clunie in Scotland (Elliott). My eighty specimens are from all parts of Suffolk, where it most abounds in the N.W. fens and coast salt-marshes,* Louisburgh in Co. Mayo; Shanklin in I.W.; Matley Bog where I have swept the pupa in August, Hinchelsea and Lyndhurst in New Forest; on the Rye sandhills in Sussex; Salisbury; Gosfield in Essex and Holme, Winterton, Wroxham and Hickling Broads in Norfolk. The cocoon is pure white with an irregular band of large black spots on either side of its centre.

PECTENELLA, n.n.

Head stout, distinctly transverse and but little constricted posteriorly; clypeus very obsoletely discreted, with no apical tooth and but inconspicuous lateral foveae; mandibles not weak, with teeth of equal length; face transverse and subparallel-sided; eyes glabrous and not internally emarginate. Thorax not convex; metathorax basally somewhat smooth and not apically produced; metanotal carinae strong, with costulae subentire; areola not longer than broad, basally constricted, apically truncate and entire; petiolar area rugose, not distinctly excavate and extending but little beyond metathoracic centre; spiracles circular. Abdomen stout and distinctly nitidulous; basal segment stout and not elongate; petiole with lateral sulci distinct, postpetiole broader and discally convex; second segment not or hardly longer than broad with subcentral spiracles; seventh segment not emarginate; terebra exerted, straight and not slender. Legs distinctly a little stout, with onychii and onyches large; claws strongly and elongately pectinate. Wings not broad, with strong nervures; areolet entire and petiolate or wanting; radial nervure hardly angled at the areolar, its apical abscissa nearly double length of the basal; lower basal nervure not oblique; nervellus oblique, slightly curved but not at all geniculate.

This genus is allied to *Gonotypa* in its short basal segment, with distinct petiolar sulci and quadrate postpetiole which, however, is distinctly broader, with the alar areolet entire, the flagellum not slender, the discoidal cell apically acute and the nervellus not geniculate; the stout and elongate pectination of the claws is remarkable.

* I was so fortunate as to sweep a pair of this species *in copula* from reeds in the salt marshes near Easton Broad on 16th September, 1914, at 11.45 a.m.

1. *latungula*, Thoms.*Angitia latungula*, Thoms. Opusc. Ent. xi. 1887, p. 1165, ♂ ♀.

A shining, grey-pubescent, black species with the legs, except at both extremities, red and wings subinfumate. Palpi, mandibles except apically, and centre of hind tibiae pale testaceous; stigma piceous, tegulae and ventral plica stramineous; legs red with all the coxae and onychii and onyches entirely, with apices of hind tibiae, deep black; hind trochanters nigrescent, the anterior ones and extreme base of hind tibiae flavous; hind tarsi infusate from apex of basal joint; terebra nearly half length of abdomen. Length, $4\frac{1}{2}$ – $6\frac{1}{2}$ mm. ♂ ♀.

The hind tibiae are often rufescent, and sometimes infusate, before their pale base.

It is a conspicuous species in its convex and unusually shining abdomen, subinfumate wings with strong nervures, the stout legs and apical tarsal joint, of which the elongately pectinate claws will distinguish it from all other Campoplegides, except perhaps the genus *Sinophorus*, which has hardly any metanotal costae. There is a certain extent of agreement with Holmgren's description of his *Tranosema pedella*, but here the radius is apically curved, the front coxae, at least of ♀, are entirely black, the antennae equally immaculate in both sexes and the second segment is not transverse. In all its subgeneric characters it is said by its author, who knew it only from France and England, to agree exactly with *Angitia rufata*, though I fail to trace any affinity whatever.

Var. *deleta*, nov. I have taken a single ♀ with no trace of alar areolet, on bushes at the end of May in Bentley Woods; and an equally deficient ♂ in marshes near Bawdsey in Suffolk at the same time of the year.

Bridgman captured it in the Brundall marshes and says (Trans. Norf. Soc. 1894, p. 621) that W. Fletcher had bred it from both *Gelechia anthyllidella* and *Laverna epilobiella*. I have annually met with this species in considerable numbers by sweeping the long and rank herbage on the banks of the Lark River at Mildenhall, Barton Mills and Tuddenham Fen in north-west Suffolk, always in very moist situations; and have taken it at Brandon in the same vicinity; from 12th June to 3rd July, since 1899. It has also occurred to me singly at Henham near Southwold in early September, by beating birch and sweeping reeds at Barnby Broad in the middle of August, by the Nene at Peterborough and on the banks of the Stour at Wimborne in Dorset in June. I fancy it must be only locally common, for I have but single females taken at Kidbrook at the end of July by Beaumont, Shere by Capron, Bugbrook in Northants by Marshall and in Ireland by Rev. W. F. Johnson. On 29th August, 1907, I captured the males alone, in plenty flying round the leaves of flowering *Epilobium hirsutum* plants growing in a ditch at Monk Soham; the time was noon and the sun powerful; none of them settled, and in vain I searched for a possibly "assembling" female. Its attachment to this plant is however confirmed by a male, which was bred by Fletcher in Worcestershire on 18th July, 1876, from *Laverna epilobiella*, Schr. Brischke has described (Schr. Nat. Ges. Danz. 1880, p. 160) both sexes of a *Limneria*, bred by him from larvae of the synonymous *Laverna fulvescens*, Haw., in Prussia on 8th August, 1878; he queries it as probably representing *L. nana*, Grav., and his is very possibly the present species, but it certainly is not Gravenhorst's, which had the hind femora basally black and a length of but 3 mm.; its cocoon is described as "elliptisch,

dünnhäutig, heller oder dunkler braun, seidenflockig." Atmore bred a female from the same host during August, 1894, at Kings Lynn in Norfolk.

ANGITIA, Holmgren.

Sv. Ak. Handl. 1858, no. 8, p. 106; Thoms. O.E. xi. 1887, p. 1153.

Body never large, usually entirely black. Head not cubical; cheeks neither elongate nor buccate, with their costae inflexed; clypeus apically simple, with small lateral foveae; mandibles not stout, narrowed towards the subequal apical teeth. Antennal flagellum usually filiform; scape small and often white beneath. Thorax cylindrical, with the mesosternum not transverse; propleurae not or hardly aciculate; metathoracic carinae distinct, areola confluent with the not transrugose petiolar area, which is not or hardly impressed or concave; costulae nearly always strong, basal area small and triangular; spiracles circular. Scutellum black. Abdomen nearly always mainly black, with the glymmal sulci of the basal segment distinct and postpetiole somewhat explanate, its sides straight and never distinctly rounded; second segment longer than third, with thyridii usually obsolete; seventh segment of ♀ often excised; terebra a little reflexed and generally about half the length of the abdomen. Legs not stout; hind tibiae often centrally whitish, infusate at apex and before base, hardly externally spinulose; tarsal claws more or less pectinate; trochanterellus usually pale. Wings with tegulae always, and stigma usually, pale; areolet as a rule small, petiolate and emitting recurrent nervure at or beyond its centre, its outer nervure sometimes obsolete and at others totally wanting; basal nervure little oblique, the parallel emitted from centre of brachial cell; discoidal cell broader apically than basally, with its lower angle acute or rarely subrectangular; nervellus neither oblique nor geniculate.

Some of the species of this genus, especially the larger ones with black abdomen, are extremely like certain *Omorgae* and a thorough knowledge of its distinguishing features is requisite to discriminate between them. The main differences lie in the vertical, postfural and (most particularly) never geniculate nervellus of the hind wing; in the not or but very slightly excavate petiolar area of the metathorax; and, to a lesser degree, in the subparallel-sided and not subglobose postpetiole. *Angitia* is a sufficiently homogeneous genus, and such specialised facies as exist will be found in the shorter and stouter petiole combined with equally incrassate terebra of the smallest species, and not as Prof. Dr. Schmiedeknecht, following Förster, has supposed, in the development of the alar areolet, the extent of which is extremely variable, though allowed by Thomson of enough importance to constitute specific rank, which in some cases I am inclined to doubt. The genus, as a whole, is entirely ubiquitous in Britain, and always figures in even the smallest collection; I have consequently taken the greatest possible care to indicate all known differences between the species, not only in the Table but under each individually; it must, however, always be borne in mind that, though this is the largest section of the old genus *Limneria*, Holmgr., yet a very great many more species are known upon the Continent. Nevertheless we have the consolation of knowing that the present group is that to which Bridgman paid especial attention and of which he probably noted all the commoner English species.

Table of Species.

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| (74). | 1. | Postpetiole not basally trifoveolate between spiracles. | |
| (71). | 2. | Apical radial abscissa of front wings longer than basal; calcaria unequal. | |
| (40). | 3. | Head vertically broad and hardly constricted behind eyes; thorax cylindrical; flagellum slender and filiform; scape usually black. | |
| (15). | 4. | Abdomen cylindrical; terebra stout and hardly longer than petiole. | |
| (12). | 5. | Cheeks and temples buccate; basal segment stout, central ones black. | |
| (7). | 6. | Clypeus not apically truncate; hind femora flavidous | 1. INSECTATOR, <i>Schr</i> |
| (6). | 7. | Clypeus apically truncate; hind femora often black-marked. | |
| (9). | 8. | Anterior coxae black; hind femora partly black | 2. PARVULA, <i>Grav</i> |
| (8). | 9. | Anterior coxae pale; hind femora not black-marked. | |
| (11). | 10. | Very slender; hind tibiae partly infusate | 3. ANULICRUS, <i>Thoms.</i> |
| (10). | 11. | Distinctly stout; hind tibiae entirely fulvous | 4. COLEOPHORARUM, <i>Ratz.</i> |
| (5). | 12. | Cheeks and temples not buccate; basal segment slender, central ones red-marked. | |
| (14). | 13. | Antennae with only the scape pale; thorax immaculate | 5. ALTERNANS, <i>Grav.</i> |
| (13). | 14. | Basal half of antennae fulvous; callosity at radices flavous | 6. RUFICORNIS, <i>Bridg.</i> |
| (4). | 15. | Abdomen fusiform; terebra slender and not shorter than basal segment. | |
| (27). | 16. | Antennae slender and nearly as long as body; hind femora partly black; size 4 mm. | |
| (18). | 17. | Areolet of the wing entire; hind femora basally black | 7. NANA, <i>Grav.</i> |
| (17). | 18. | Areolet of the wing wanting; hind femora mainly black. | |
| (24). | 19. | Head not strongly buccate, nor petiole stout; hind femora black. | |
| (23). | 20. | Legs fulvous; scape black; postpetiole elongate. | |
| (22). | 21. | Alar stigma infusate; third abdominal segment quadrate | 8. ELISHAE, <i>Bridg.</i> |
| (21). | 22. | Alar stigma stramineous; third segment elongate | 9. ANNULIPES, <i>Bridg.</i> |
| (20). | 23. | Legs stramineous; scape red; postpetiole transverse | 10. CROCEIPES, <i>Marsh.</i> |
| (19). | 24. | Head strongly buccate, petiole very stout; hind femora piceous. | |
| (26). | 25. | Face transverse; costulae wanting; scape black | 11. PUSIO, <i>Holmgr.</i> |
| (25). | 26. | Face quadrate; costulae present; scape always pale | 12. CRASSA, <i>Bridg.</i> |

- (16). 27. Antennae stout and much shorter than body; femora rarely black; size at least 5 mm.
- (31). 28. Alar areolet regularly triangular and strong throughout.
- (30). 29. Body distinctly dull; terebra half length of abdomen 13. SORDIPES, *Thoms.*
- (29). 30. Body glittering; terebra two-thirds length of abdomen 14. ACULEATA, *Bridg.*
- (28). 31. Alar areolet oblique, externally weak below, rarely wanting.
- (33). 32. Alar stigma narrow, with the areolet entirely wanting 15. APOSTATA, *Grav.*
- (32). 33. Alar stigma normal, with areolet more or less entire.
- (35). 34. Metathorax apically rugose; mesopleurae nitidulous 16. RUFIPES, *Grav.*
- (34). 35. Metathorax not apically rugose; mesopleurae dull.
- (37). 36. Hind tibiae testaceous; terebra shortly exerted 17. CLARIPENNIS, *Thoms.*
- (36). 37. Hind tibiae infuscate-marked; terebra not shortly exerted.
- (39). 38. Antennae apically attenuate; terebra elongate 18. MAJALIS, *Grav.*
- (38). 39. Antennae filiform; terebra not at all exerted 19. ALBONOTATA, *Bridg.*
- (3). 40. Head vertically narrow and distinctly constricted behind eyes; thorax not cylindrical; flagellum attenuate and somewhat stout; scape usually pale below.
- (64). 41. Thorax not gibbulous; hind calcaria short; speculum shining; scape usually pale.
- (59). 42. Second segment elongate, seventh of ♀ often incised; hind tibiae usually whitish.
- (48). 43. Areolet regularly triangular, emitting recurrent from centre; terebra about half abdomen.
- (47). 44. Hind tibiae black-marked; terebra half length of abdomen.
- (46). 45. Cheeks elongate; hind femora at least basally black 20. FENESTRALIS, *Holmgr.*
- (45). 46. Cheeks short; hind femora fulvous throughout 21. CHRYSOSTICTA, *Grav.*
- (44). 47. Hind tibiae immaculate fulvous; terebra one third abdominal length 22. LATERALIS, *Grav.*
- (43). 48. Areolet irregular, emitting recurrent beyond centre; terebra often very short.
- (52). 49. Flagellum slender and subfiliform; seventh ♀ segment always incised.
- (51). 50. Hind tibiae centrally white; second segment subquadrate 23. CEROPHAGA, *Grav.*
- (50). 51. Hind tibiae red; second segment half as long again as broad 24. CYLINDRICA, *Brisch.*

- (49). 52. Flagellum stout and attenuate, or seventh ♀ segment not incised.
 (54). 53. Length, 5 mm.; flagellum stouter; seventh ♀ segment incised .. 25. *ARMILLATA, Grav.*
 (53). 54. Length, 4 mm.; flagellum less stout; seventh ♀ segment not incised.
 (56). 55. Postpetiole elongate, its spiracles not prominent .. 26. *TIBIALIS, Grav.*
 (55). 56. Postpetiole quadrate, its spiracles prominent; terebra shorter.
 (58). 57. Hind femora fulvous; front coxae infusate .. 27. *VIRGINALIS, Grav.*
 (57). 58. Hind femora black-marked; front coxae flavous .. 28. *GRACILIS, Bridg.*
 (42). 59. Second segment short, seventh of ♀ not incised; hind tibiae not centrally white.
 (61). 60. Clypeus apically truncate; mandibles not small; terebra curled .. 29. *VESTIGIALIS, Ratz.*
 (60). 61. Clypeus not truncate; mandibles small; terebra not or less curled.
 (63). 62. Abdomen and femoral marks black; terebra reflexed .. 30. *CURVICAUDA, Holmgr.*
 (62). 63. Abdomen centrally and all femora red; terebra straight .. 31. *RUFATA, Bridg.*
 (41). 64. Thorax gibbulous; hind calcaria elongate; speculum dull; scape rarely pale.
 (66). 65. Areolet entire; discoidal cell apically acute below .. 32. *INTERRUPTA, Holmgr.*
 (65). 66. Areolet wanting; discoidal cell apically rectangular below.
 (70). 67. Hind tibiae fulvous; terebra distinctly exserted.
 (69). 68. Mesonotum and mesopleurae very distinctly punctate .. 33. *EXAREOLATA, Ratz.*
 (68). 69. Mesonotum and mesopleurae reticulate and impunctate .. 34. *RETICULATA, Bridg.*
 (67). 70. Hind tibiae stramineous; terebra not at all exserted .. 35. *FITCHI, Bridg.*
 (2). 71. Apical abscissa not longer than basal; calcaria of subequal length.
 (73). 72. Stigma stramineous; terebra a third of abdominal length .. 36. *COMBINATA, Holmgr.*
 (72). 73. Stigma infusate; terebra half of abdominal length .. 37. *VARIABILIS, Bridg.*
 (1). 74. Postpetiole distinctly trifoveolate between spiracles .. 38. *TRIPUNCTATA, Bridg.*

1. *insectator, Schr.*

Ichneumon insectator, Schr. En. 1781, 370; Gmel. Linn. Nat. 1790, 2698; Oliv. Encycl. méth. vii. 223, ♀. *Campoplex insectator*, Gr. I.E. iii. 481, ♀. *Linneria insectator*, Bridg.-Fitch, Entom. 1885, p. 106. *Angitia insectator*, Thoms. O.E. xi. 1154, ♂ ♀.

A black species with the palpi and mandibles centrally flavidous, and antennae little shorter than the body. Abdomen immaculate, fully as long as head and thorax and slightly narrower than the latter; petiole

short and stout, a little shorter than the postpetiole, which is longer than broad; terebra not longer than basal segment. Legs flavidous with the hind coxae entirely and in ♀ the anterior except apically black; hind trochanters black. Wings with tegulae pale flavous, areolet small, irregular and elongately petiolate. Length, nearly 5 mm.

The old descriptions bear little or nothing distinctive; but Thomson separates this and the next three species from all the rest of the genus, thus:—Head with the vertex not or hardly constricted, face parallel-sided, cheeks subbuccate, peristomium and mandibles small; antennae longer than half body, with flagellum filiform and slender, and scape usually immaculate black; thorax elongate, with no costulae; areola short and laterally continuous with petiolar area; abdomen black, unusually compressed, becoming nitidulous and nearly glabrous towards its anus, with second segment elongate and the seventh dorsally emarginate and laterally cleft to its base on either side; terebra strongly curved with stout spicula, generally a little longer than the petiole which is shortish and thick, but little narrower than the postpetiole; areolet small and petiolate, emitting recurrent nervure slightly before its apex.

Widely distributed and recorded from Austria, Piedmont, France and near Lund. It figures in Marshall's 1870 and 1872 catalogues, but I find no explicit British records. I can confirm it as indigenous, since he himself gave me a female, which he was unable to name, taken at Botusfleming in Cornwall; and I have found the species at Wilverley in the New Forest in the middle of June.

2. *parvula*, Grav.

Camptoplex parvulus, Gr. I.E. iii. 489, ♀. *Limneria parvula*, Bridg.-Fitch, Entom. 1885, p. 107, ♀. *Angitia parvula*, Thoms. O.E. xi. 1155, ♀.

This female differs from the last species in nothing but its pedal colouration, truncate clypeus and possibly larger size. Anterior legs testaceous, with trochanters paler and coxae black; hind legs fulvous with coxae and trochanters black, apices of femora nigrescent, tibiae dull whitish with a mark before their base and a broader one at their apex infusate, tarsi infusate with the first joint basally stramineous. Abdomen not shorter than head and thorax, with terebra about as long as basal segment or a fourth of the body. Length, $4\frac{1}{2}$ – $5\frac{1}{2}$ mm.

The male has not hitherto been described and differs somewhat considerably from the female in having the hind femora nearly entirely black and their tibiae much darker. In both sexes the mandibles are black and the basal third of the hind tarsi alone is pale, with remainder nigrescent throughout.

Our claim to this species as British has hitherto been chimerical, and rested solely upon its inclusion in Marshall's catalogues. Only two records seem to exist: Gravenhorst received a single specimen from about Warmbrunn in Silesia, and Thomson found the female in Norway. My Clare Island reference to this species (Proc. R. Irish Acad. 1911, No. 24) is an error. I am able to confirm this species as British on the strength of one female (which has the apices of the second to fourth segments laterally dull red) and two males, bred together, with a single *Apanteles*, during July, 1906, from *Caloptria tripoliana*, Barr., at Yarmouth in the Isle of Wight by Mr. E. R. Bankes.

3. *annulicrus*, Thoms.

Campoplex dispar, Grav. I.E. iii. 484, ♂ (?). *Angitia annulicrus*, Thoms. O.E. xi. 1187, 1155, ♂ ♀.

A black and extremely slender species with the mandibles except apically, palpi, centre and extreme base of hind tibiae, apices of anterior coxae, their trochanters entirely, sometimes in ♀ and always in ♂ the hind trochanterellus, stramineous; remainder of legs fulvous with coxae except part of anterior black, and marks at apex and before base of hind tibiae infusate; hind tarsi distinctly pale, with only apices of their joints slightly infusate; front coxae of ♂ entirely stramineous. Head slightly constricted behind the eyes; abdomen much longer than head and thorax, with terebra as long as basal segment. Length, 4-5 mm.

It is like *A. parvula* in the colouration of the hind tibiae, but differs in its pale anterior coxae, immaculate hind femora and mainly testaceous hind tarsi, in the elongate abdomen, and posteriorly narrower head. It is a much more fragile and slender species than *A. coleophorarum*, with hind tibiae bicoloured.

It was originally described from Päljö in Sweden and has not since been noticed. I took a female in the Bentley Woods on 4th August, 1899; Mr. Bankes has been so good as to present me with three males and a couple of females (only one of which has the hind trochanterellus pale), bred together, with a female of the Braconid *Agathis brevisetis*, Nees, from *Coleophora albitarsella*, Zell., between 18th June and 27th August, 1904, in the Isle of Portland. He bred a second batch of three males and a female during July, 1904, from the same host, the larvae of which were collected on 7th of the preceding May in the Isle of Purbeck, Dorset. I place Gravenhorst's compound species as a doubtful synonym here, simply because a pair of *A. annulicrus* was so named with no query in Dr. Capron's collection; and because both sexes are doubtfully recorded, under the genus *Limneria* (Entom. 1884, p. 70), as having been bred by Fletcher of Worthing from both *Coleophora albitarsella* and *C. genistaecolletta*: pretty plainly proving that the present is the species formerly known under that name, at least in England.

4. *coleophorarum*, Ratz.

Campoplex coleophorarum, Ratz. Ichn. d. Forst. iii. 90 (?). *Angitia coleophorarum*, Thoms. O.E. xi. 1155, ♂ ♀.

A black species with the antennal scape beneath and legs fulvous; hind coxae alone black; terebra half length of abdomen and the somewhat broad areolet nearly sessile. It is the only species with elongate thorax and cylindrical, apically strongly excised abdomen that has the terebra half as long as the last, the legs fulvous with hind tibiae immaculate and their coxae alone black. The metathorax is extremely finely shagreened, with no trace of costulae; the somewhat narrow areolet emits the recurrent nervure but shortly before its apex; and the legs are very slender. Length, 5 mm.

Ratzeburg's species, bred by Reissig from *Coleophora*-species and *Lithocolletis syringella*, seems to be compound, and Thomson must have been

uncertain concerning his synonymy, since the areolet was either absent or entire.

It has hitherto been known only from Småland in Sweden. I captured a female, along with *Omorga Fluvius*, on fennel flower at Ringstead village in Norfolk on 21st August, 1906, a second also on fennel flower at Alderton in Suffolk on 3rd September, 1899, and swept another at Henstead marshes near Lowestoft early in July, 1906; the male has only occurred to me at Southwold in early September. The cylindrical body is remarkable.

5. *alternans*, Grav.

Campoplex alternans, Gr. I.E. iii. 537, ♀. *Limneria alternans*, Bridg.-Fitch Entom. 1885, p. 205, ♀. *Angitia alternans*, Thoms. O.E. xi. 1167, ♂ ♀.

Black with the body small and very slender, and abdomen fasciated with red. Head with vertex broad, cheeks not buccate, mouth small and ♀ face narrow; palpi and mandibles stramineous. Antennal flagellum very slender and nearly as long as body; scape flavidous beneath. Thorax elongate and immaculate, with areola long. Abdomen linear and narrower than thorax, black with apices of the second to fourth segments and most of the fifth testaceous-red; postpetiole subquadrate, a little broader than petiole; second segment elongate with large thyridii; anus compressed and the reflexed terebra very slightly exerted. Legs rufescent-testaceous, with hind coxae black and the anterior, as well as both joints of trochanters, whitish; hind tibiae hardly infusate at apex and before base. Areolet subsessile or nearly pentagonal. Length, 4–5 mm.

This and the next species are divided from all the rest of the genus by Thomson as alone possessing:—The capital vertex broad though roundly constricted behind the eyes, the ♀ face narrow, cheeks not buccate and mouth small; the areolet nearly sessile or subpentagonal; the abdomen linear and fasciated with red, its second segment elongate with large thyridii and the terebra hardly exerted; the body small and very slender, with the flagellum very thin and nearly as long as the body. The present species cannot be *Meloboris alternans* (Brisch. 1880, p. 174, ♀), for that has the nervellus geniculate.

It is said to be rare in northern and central Europe, and I much doubt its being truly British. Gravenhorst knew a single Silesian female; it has been found by Thomson at Ortofta near Lund and by Dr. Lethierry in France. It was, probably erroneously, introduced as British in Marshall's 1870 Catalogus, and has not since been mentioned—except in the unreliable Devon catalogue by Parfitt, who states it to have been "taken on the heads of Umbelliferae in June." I have seen nothing like it.

6. *ruficornis*, Bridg.

Limneria ruficornis, Bridg. Trans. Ent. Soc. 1884, p. 429, ♂ ♀. *Angitia ruficornis*, Schm. Opusc. Ichn. 1789, ♂ ♀. (?) *A. gracilis*, Thoms. O.E. xi. 1167 (*nec Grav. non Ratz*).

Head somewhat constricted behind the eyes, face transverse and parallel-sided, clypeus not basally discreted; mouth and mandibles flavous, latter with upper tooth distinctly a little the longer. Antennae pilose, with their basal half and more or less of apex, and underside of scape, pale fulvous; of ♂ about as long as body, of ♀ somewhat shorter.

Thorax longer than broad, with a flavous callosity before the concolorous tegulae; metathorax subelongate with the apically subentire areola hexagonal and longer than broad, and the costulae not always discreted. Abdomen black with the second segment apically, third and fourth except base of former, and apices of the remaining segments rufescent; postpetiole longer than broad, double breadth of and not longer than petiole; second segment about a third longer than broad, in ♂ somewhat longer with its basal third constricted at the large and pale thyridii; third subquadrate; terebra about a third the length of basal segment. Legs slender and pale red; anterior coxae and all the trochanters flavous; hind coxae except apically black; hind tibiae and tarsi not at all infuscate, unicolorous fulvous. Areolet sessile or subsessile, emitting recurrent nervure at or slightly beyond its centre; nervellus quite straight and not geniculate. Length, 4.5–5 mm.

Schmiedeknecht has correctly pointed out that there is no such insect as *Limneria gracilis*, Holmgr., and the present species is equally certainly neither *Campoplex gracilis*, Grav.,* nor Ratz. He considered its position under *Angitia* very doubtful, and thought it as least as closely allied to *Olesicampe*—mainly because Bridgman considered it “comes very near *Limneria longipes*, but the antennae is differently coloured, as are the coxae and trochanters; the insect is also much smaller, and the head is not so large”—though he seems to have overlooked Bridgman’s express statement “teeth of mandibles of equal length,” which at once excludes it; if it could be there placed it would fall into Thomson’s group E at p. 1143. Thomson considered the present species to be very similar to *A. alternans* in the characters indicated under the latter, but to differ in having the metanotal costulae wanting, the hind tibiae dull stramineous with apices infuscate, their femora sometimes concolorous, and the abdomen centrally less broadly red.

Both sexes were originally bred at Worcester by Fletcher on 13th August, 1873, from the cocoons of *Elachista cerussella*, in leaves of grass and a doubtful male variety, with darker antennae and apices of the second to fourth segments alone rufescent, was captured at Brundall near Norwich; the latter was probably later found to be distinct, for Bridgman does not include this species in his Norfolk List of 1894. I possess a single male (headless, but agreeing in every way with the type, which I have examined at Norwich, certainly belonging to *Angitia*), given me by Hartley Durrant and bred by Barrett from “*Elachista cerussella*,” which exactly agrees with Bridgman’s type, especially in hind tibial colour. I do not find that Thomson took it in Sweden.

7. *nana*, Grav.

Campoplex nanus, Gr. I.E. iii. 469, ♀; (?) Ratz. Ichn. d. Forst. iii. 85, ♂. *Limneria nana*, Bridg.-Fitch, Entom. 1885, p. 106 (*nec* Brisch. 1880, p. 160). *Angitia nana*, Thoms. O.E. xi. 1164, ♂ ♀.

Black with the palpi and centre of mandibles flavous. Antennae with neither the scape flavoidous, nor flagellum rufescent, beneath. Abdomen not at all red; postpetiole longer than broad, and as long and twice as

* I have traced Thomson’s error in Bridgman’s Norwich collection, where the larger examples stand under the name “*ruficornis*, Bridg.” (in MS.) and the smaller incorrectly under that of *Limneria “gracilis”* (cut from Marshall’s 1872 catalogue); the latter is Gravenhorst’s name, but Bridgman in writing to Thomson—from whom are many, apparently cotypal, specimens of Swedish species at Norwich—probably inserted “Holmgren,” without referring to that author.

broad as petiole; terebra a fourth of the abdominal length, nearly as long as petiole. Legs slender and pale fulvous, with coxae and most of hind trochanters black; hind femora basally nigrescent above; tibiae apically and before their base nigrescent, hind ones centrally white. Areolet irregular and petiolate, minute or apically obsolete. Length, hardly 3 mm.

This species differs from all our others of the genus in its small size of not more than three millimetres, in the whole hind trochanterelli and centre of tibiae being white; in the somewhat broad and not or hardly constricted vertex, the antennae nearly as long as the body with flagellum filiform, pilose and very slender, in the short terebra and by no means elongate second segment. In all these characters it agrees with *Dioctes*, though distinct in its oblique and always more or less complete areolet, the stout and red hind femora, and in having all the trochanters and the anterior coxae whitish.

Gravenhorst knew a single female from Sickershausen; it has also been found in Belgium, Sweden and France. As British it was included in Desvignes 1856 Catalogue, but seems to have been rarely met with, for none of our local lists contain it, and the only two records I can find are its emergence from *Laverna conturbatella* and *L. epilobiella* (Entom. 1881, p. 140), and *L. fulvescens* (*lib. cit.* 1883, p. 66), both of which certainly refer to Brischke's species, and this, I am nearly sure, is referable to *Pectinella latungula*, with no connection to Gravenhorst's insect. Consequently, I am glad to be able to confirm *A. nana* as British on the strength of half-a-dozen examples in my collection, taken at Greenings in Surrey by Wilson Saunders in June, 1871, at Yelverton in Devon by Bignell on 18th July, and in Beaufort Park near Hastings by myself on 18th July, 1909; on 18th May, 1900, Prout bred a pair from British *Fumea intermedella*, and on 22nd June, 1899, Chapman sent me a male reared from Continental *Psyche opacella*.

8. *Elishae*, Bridg.

Limneria Elishae, Bridg. Trans. Ent. Soc. 1884, p. 426, ♂ ♀. *Angitia Elishae*, Thoms. O.E. xi. 1165. *Dioctes Elishae*, Schm. Opusc. Ich. 1645, ♂ ♀.

A small black species with the black hind legs dull white-marked, areolet wanting and terebra but slightly longer than postpetiole. Head very little constricted posteriorly, with face parallel-sided; mandibles flavidous. Antennae nearly as long as body. Metathorax elongate, with areola pentagonal and longer than broad; costulae obsolete or wanting. Abdomen immaculate black with terebra very short, though exerted; petiole unusually short, postpetiole longer than broad and laterally rounded; second segment hardly a third longer than broad, and the third subquadrate. Legs fulvous with coxae, and intermediate or anterior femora mainly, black; their trochanters pale; hind legs piceous or black with trochanters, centre of tibiae and the tarsal base, whitish; calcaria short. Stigma infuscate, areolet wanting. Length, $2\frac{1}{2}$ – $4\frac{1}{2}$ mm.

This and the next four species are known from all other *Angitiae* by their entirely lacking areolet and black hind femora; and they share with *A. nana* alone, in Britain:—vertex not or hardly constricted, antennae nearly as long as body with flagellum very slender, filiform and pilose, the

second segment short with terebra not longer than postpetiole, the hind trochanterellus and tibial centre whitish, and a small size of rarely more than four millimetres.

Originally this species was bred in England by G. Elisha from *Ornix scoticella* or *Nepticula aucuparia* (Entom. 1884, p. 67); and it has not yet been noticed on the Continent. Subsequently Dale raised it in Dorset from *Colcophora flavaginella*, Lienig. (E.M.M. 1887, p. 214). It is by no means common and I possess less than a dozen specimens; J. C. Watkins sent me a pair, bred together from the leaves of *Hypericum perforatum* in in the autumn of 1895 near Painswick in Gloucester; Rev. C. D. Ash bred a female on 1st May, 1899, from *Lithocolletis emberizaepennella*, Boie, found at Selby in Yorks in October; and Bankes raised a female, with two *Apanteles*, in July, 1906, from *Coleophora atricoella*, Zell., found at Yarmouth in the Isle of Wight. Adams has captured it at Lyndhurst in July, and I have occasionally swept it in Suffolk at Bungay by the Waveney in June and in Bentley Woods on 22nd September; it seems commonest towards the end of the latter month and I have then taken the males at Barnby Broad and Foxhall on the flowers of *Angelica sylvestris* sparingly. Bridgman later took it in autumn at Mousehold and Earlham near Norwich, and adds (Trans. Norf. Soc. 1894, p. 620) *Gracillaria tringipennella*, *Coleophora discordella*, *Bedellia somnulentella* and *Gelechia vilella* to its hosts.

9. *annulipes*, Bridg.

Limneria (*Angitia*) *annulipes*, Bridg. Trans. Ent. Soc. 1889, p. 424, ♂ ♀.

Black and slightly nitidulous. Head somewhat constricted behind the eyes, with the face subquadrate and clypeus apically rounded; cheeks not buccate; palpi and mandibles flavous. Antennae filiform, somewhat shorter than body and apically hardly attenuate. Thorax subelongate; metathorax somewhat smooth and shining, with upper areae entire; areola pentagonal, longer than broad and apically distinctly entire. Abdomen slender with postpetiole subglobose and about a third broader than petiole; remaining segments subparallel-sided; the second a third longer than broad, as long as the first and, like it, scabriculous with the following smoother and third quadrate; terebra only just exerted. Legs flavescent-red; all the coxae and base of hind trochanters black, anterior trochanters stramineous and apices of intermediate femora nigrescent; hind trochanterellus, extreme base of both their tibiae and tarsi, with centre of the former broadly, whitish. Wings with stigma and tegulae stramineous; areolet entirely wanting, apical radial abscissa curved; nervellus not geniculate. Length, 3.5 mm.

It is said to be very like *A. croceipes* and to come very near *A. Elishae*, from which it differs in having the second and third segments longer, the terebra shorter and stigma pale.

Bridgman knew a single pair, both sexes of which were bred from *Bucculatrix cidariella*, the female by Atmore—presumably not in Norfolk, since it does not figure in his county list of 1894—and the male by Fletcher of Worthing.

10. *croceipes*, Marsh.

Limmeria croceipes, Marshall, E.M.M. 1876, p. 194; Bridg.-Fitch, Entom. 1885, p. 105, ♀.

Somewhat shining, alutaceous, finely sericeous and black. Head transverse and posteriorly constricted, with the eyes internally hardly emarginate; mandibles, mouth and palpi stramineous. Antennal scape rufescent beneath. Thorax alutaceous; metathorax rugulose and not excavate, with costulae obsolete. Abdomen with the postpetiole transverse and a little convex; the second segment not longer than broad, with pellucid gastrocoeli; terebra shortly exerted, testaceous, reflexed and not higher than abdomen. Legs pale flavous, with anterior coxae basally red and their femora subfulvidous; hind coxae and femora black, their tibiae apically infusate-red. Wings with the stigma infusate; areolet entirely wanting, apical radial abscissa straight; nervellus not geniculate. Length, 6 mm. ♀ only.

This species is said to be allied, in Holmgren's table, to *A. exarcolata*, Ratz., simply on account of its lacking areolet.

The locality is corrected from Cadder Wilderness to Kingussie (*lib. cit.* p. 228).

11. *pusio*, Holmgr.

Meloboris pusio, Holmgr. Sv. Ak. Handl, 1858, p. 100, ♀. *Angitia pusio*, Thoms. O.E. xi. 1165, ♀. *Nythobia pusio*, Schm. Opusc. Ichn. 1647, ♀.

Head subbuccate and not constricted posteriorly, with the face transverse, clypeus apically rounded, mandibles narrow and teeth equal, eyes not internally emarginate; palpi and mandibles flavidous. Antennae filiform, longer than head and thorax, and not apically attenuate. Thorax somewhat longer than high; metathorax rugose, with acute carinae; areola apically incomplete, costulae wanting. Abdomen apically compressed and black, with apical margin of the short second segment and lateral marks on the subquadrate third red; basal segment somewhat short and stout, with postpetiole convex, subquadrate and nearly double breadth of petiole; terebra hardly at all exerted. Anterior legs testaceous, their coxae black with apices, and trochanters, pale flavous; intermediate femora sometimes basally infusate; hind tarsi, apices and a mark before base of their tibiae, with both coxae and trochanters, nigrescent; hind femora piceous or nigrescent, usually basally paler; tibiae centrally whitish, as is base of tarsi. Stigma infusate, tegulae pale; areolet wanting. Length, 3-4 mm. ♀ only.

I do not know this species and do not believe it to be British. Schmiedeknecht has utilised one of Förster's genera for it, though that is said to differ from *Diocles* only in its lacking metanotal costulae, which in *D. Elishae* are obsolete or wanting. In fact, it is only because Thomson knew both species, and distinguished them by the centrally red-marked abdomen and shorter terebra of the present, that I regard *A. Elishae* as distinct.

This is one of the smallest species of *Angitia* and was first taken by Boheman in Sweden, where Thomson later found it at Lund; Schm. met with a few specimens in Thuringia, and it is recorded by Gaulle from France. I have seen nothing like it, but Bridgman introduces it (Trans. Ent. Soc. 1882, p. 153) as British on the strength of two males—which he failed to describe—and a female from Marshall's collection, without locality.

12. *crassa*, Bridg.

Limneria (*Angitia*) *crassa*, Bridg. Trans. Ent. Soc. 1889, p. 425, ♂ ♀.

A black species with the abdomen centrally red-marked; the scape and legs pale, hind coxae black; terebra shorter than basal segment, and areolet wanting. Length, 3 mm.

This species is extremely closely allied to *A. pusio*, and shares with it the peculiarly short and stout basal segment. I should have been tempted to synonymise them, presuming on Bridgman's ignorance in nature of the former species, were it not that a careful comparison shows the present to differ in having:—the flagellum apically slightly attenuate, the head transverse though scarcely constricted posteriorly, the face quadrate, the metanotal costulae subcomplete, the third abdominal segment transverse with terebra two-thirds the length of the basal one; the scape of the ♀ is basally flavidous beneath and of ♂ entirely flavous, as are the anterior coxae and hind trochanters of both sexes; the hind femora are flavescent-red, with their tibiae paler, the stigma is pale and the length circa 3 mm.; the ♂ has a lateral abdominal rufescent mark, extending from the apex of second almost to apex of third segment, and the ♀ has the third segment laterally, the second except discally, and the fourth slightly, rufescent.

A single pair was raised by W. H. B. Fletcher from the larvae of *Bucculatrix cidariella* at Abbots Wood near Polegate in Sussex.

13. *sordipes*, Thoms.

Angitia sordipes, Thoms. Opusc. Ent, xi. 1887, ♀.

Head with the vertex hardly constricted, face parallel-sided, cheeks subbuccate, peristomium and mandibles small. Antennae longer than half-body, with the filiform flagellum slender and scape black. Thorax not elongate, with areola short and laterally continuous with petiolar area; costulae wanting. Abdomen subfusiform and pubescent with the petiole slender and second segment not elongate; terebra slender and fully half length of abdomen. Legs black; femora dull red with the anterior basally below, and the hind ones also above, nigrescent; tibiae dull red and never white-marked, the hind ones infusate at apex and before their base. Wings with stigma broad, infusate testaceous; areolet small and subpetiolate, emitting recurrent nervure a little before apex. Length, 4 mm. ♂ ♀.

It is similar to *A. insectator* in the structure of the head, antennae, meta-thorax and areolet, but the thorax is less elongate, the abdomen subfusiform with the slender terebra nearly double as long, roughly pubescent, the petiole less stout and a little longer, the second segment shorter, the stigma broader and the hind tibiae not white-banded.

Hitherto it has been known only from Sweden, where Thomson described it from Pälssjö, in the female sex. The late Mr. Alfred Beaumont has give me a female, correctly named by Prof. Sigismund Brauns, which he caught at Whitby in Yorks on 25th August, 1897; I captured certainly co-specific males, differing only in their normally more slender abdomen, at Henstead marsh in Suffolk on 6th July, 1906, and at Louth in Lincolnshire in June, 1912.

14. *aculeata*, Bridg.

Limneria (Angitia) aculeata, Bridg. Trans. Ent. Soc. 1889, p. 428, ♀.

Head transverse and somewhat dull, anteriorly subtriangular, vertex slightly oblique; face subquadrate, clypeus basally discreted and apically rounded, mandibular teeth of equal length and rufescent with palpi testaceous. Antennae about half length of body and apically attenuate. Thorax subnitidulous; metathorax smooth and shining, rounded with hardly any sculpture, except five discal areas, of which the areola is not longer than broad; mesopleurae nitidulous and punctate, with speculum smooth. Abdomen smooth and shining; postpetiole but slightly shorter than petiole, stout and fully double breadth of petiole, parallel-sided; second segment a third longer than broad; third slightly transverse; sixth and seventh discally deeply emarginate; terebra reflexed and fully two-thirds as long as abdomen. Legs not stout, red with coxae and base of front trochanters black, hind trochanters concolorous with extreme apices red; all the tibiae pale stramineous, with the apices and a mark before base of hind ones rufescent-infusate; hind tarsi infusate with calcaria and nearly whole of basal joint pale. Stigma flavidous testaceous, tegulae stramineous; areolet subpetiolate or subsessile, emitting recurrent nervure almost from its centre; apical radial abscissa nearly straight, stigma not narrow, nervellus entire. Length, 7 mm. ♀ only.

"It is easily distinguished by the long aculeus, the sixth and seventh dorsal segments of the abdomen being deeply notched, and the colour of the legs," says its author; though it is very distinct from all other species of the genus (except perhaps *A. maculata*) in the very strongly nitidulous and subglabrous body, and deeply punctate mesonotum with its interstices not at all reticulate.

Two females were bred by W. H. B. Fletcher from *Lycaena alsus* during August, 1883, with no definite locality. The only other known example appears to be a female in my own collection, captured some twenty years ago by the late Mr. Albert Piffard at Felden near Boxmoor in Hertfordshire.

15. *apostata*, Grav.

Campoplex apostata, Gr. I.E. iii. 510, ♀. *Limneria apostata*, Bridg.-Fitch, Entom. 1885, p. 105, ♀. *Angitia Apostata*, Thoms, O.E. xi. 1161, ♂ ♀. *Diocetes apostata*, Schm. Opusc. Ichn. 1643.

Head but slightly constricted posteriorly, with the palpi and underside of scape flavous. Thorax with the mesopleurae evidently punctate and their interstices alutaceous, speculum dull; metathorax alutaceous; with costulae fine. Abdomen black with ventral plica infusate, and terebra less than half length of abdomen. Legs flavidous fulvous, with the anterior trochanters flavous; hind coxae and trochanters black, most of their tarsi except basally, the apices and often a subbasal indefinite mark on their tibiae infusate; hind tibiae centrally testaceous. Stigma narrow and flavidous, tegulae stramineous; areolet entirely wanting. Length, $3\frac{1}{2}$ mm.

This is quite a small species, strongly resembling *A. nana* but known by the total lack of areolet; both Thomson and Schmiedeknecht give its length incorrectly at 5-6 mm. though it was rightly placed at $1\frac{1}{4}$ lines by Bridg.-Fitch.

Apparently little known on the Continent; Gravenhorst had but a single Silesian female; Giraud records it (Ann. Soc. Fr. 1877, p. 403) as bred from both *Mamestra cleracea* and *Nematus Vallisneri* (*Pontania proxima*) in France; and it has been observed in Sweden and Thuringia. With us it is distinctly uncommon; Bridgman says Atmore has bred it at Kings Lynn in Norfolk from *Depressaria assimilella* and it was contained in Desvignes' collection in 1856. I have males captured in the Bentley Woods in the middle of July and at Stoke by Clare in Suffolk in the middle of June; others were bred by Chapman on 6th May, 1901, from *Mesia vinculella* at Pegli, and by G. W. Mason on 7th August, 1904, from *Plutella porrectella* at Barton on Humber; Capron took a female at Shere and I beat another from birch bushes on 17th May, 1901, at Assington Thicks in Suffolk.

16. *rufipes*, Grav.

Campoplex difformis, Gr. I.E. iii. 458 (*part.*). *C. rufipes*, Gr. *lib. cit.* 461, ♀, excl. var. *C. fumipennis*, Holmgr. Sv. Ak. Handl. 1854, p. 12, ♂ ♀. *Porizon crucator*, Zett. I.L. 394; *Limneria crucator*, Holmgr. Sv. Ak. Handl. 1858, p. 58; Brisch. Schr. Nat. Ges. Danz. 1880, p. 149; Bridg.-Fitch, Entom. 1885, p. 106, ♂ ♀. *L. rufipes*, Bridg.-Fitch, *l.c.* p. 107; *Angitia rufipes*, Thoms. O.E. xi. 1161, ♂ ♀.

A dull black species, with the head very little constricted posteriorly; palpi and centre of mandibles flavidous. Antennae somewhat longer than head and thorax, with the scape not pale beneath. Thorax stout, with mesopleurae subnitidulous; metathorax apically rugosely punctate; areola transverse, with costulae fine but distinct. Abdomen compressed; basal segment as long as hind coxae and trochanters, with postpetiole convex and laterally not rounded; second segment longer than broad, with its apical margin not unusually rufescent; ventral plica infusate; sixth segment of ♀ emarginate; terebra fully half length of abdomen. Legs red with coxae, base of trochanters and the hind trochanterelli black; hind tibiae not or hardly infusate-marked; calcaria whitish, their tarsi apically infusate. Wings often somewhat distinctly infumate, with stigma flavescent; radial nervure basally curved near the stigma; areolet oblique, emitting recurrent nervure beyond its centre. Length, 6–7 mm.

This is the typical species of a small group having:—The vertex not or but little constricted; the scape nearly always black; abdomen black and double length of terebra, with the seventh ♀ segment usually excised; areolet oblique, emitting recurrent beyond its centre; with a medium length of 5–6 mm. From the rest of this group, the present species is known by its nitidulous mesopleurae, apically rugosely punctate metathorax, with transverse areola and distinct costulae, its black scape and hind trochanterellus. It has much the facies of *Omorga*.

Common, probably throughout the palaearctic region; it is recorded from Silesia in August, bred in Prussia by Brischke from *Nothris verbasella* and larvae of *Cladius albipes* (*padi*); France, Belgium in May and June, Holland in April, Lapland and not infrequent throughout Sweden. Rondani is said to also have raised it from *Tortrix laevigana*, Hüb. and *Coleophora vibiciella*; Gaulle adds *Cacoecia* and *Conchylis* as host-genera. In Britain it has been instanced from Brundall near Norwich (Bridgman), bred in Devon on 21st April from *Eupithecia castigata* and on 30th June

from *Hybernia progemma* (Bignell), Lands End (Marquand). Further hosts have been brought forward as *Penthina gentianana* (Entom. 1881, p. 140), *Spilonota neglectana*, *Gelechia obsol.tella*, *G. hippophaella*, *Larerna fulvrescens* (l.c. 1883, p. 66), *L. pilobella* (l.c. 1884, p. 70), and *Phycis nimbella* (Bridgman), with more or less accuracy. Probably few of the above hosts are correct, for I find I possess less than a score of the present species: from Shere (Capron), Bugbrook in Northants (Marshall), Guestling in 1876 (Bloomfield); a male was bred from *Cnephasia* (? *Sciaphila*) *virgaureana* during 1899 in Somerset (Chapman); two females from larvae of *Mimasceptylus fuscus* (*pterodactylus*) in November, 1905 (Bacot); and a pair from *Tortrix paleana* at Middleton Dale near Worksop on 25th July, 1905, by Lady Robinson (née Alderson), who remarked that the larvae leave the host before pupating; the male cocoon of this pair is nearly cylindrical, 7 mm. in length and 1½ mm. centrally broad, it is dull, semi-transparent and extremely pale flavous, with a narrow and very definite central whitish girdle; one end shows brown exuviae and the imago, in emerging, entirely removes the other in an irregular manner. The imago has occurred to me only in Suffolk: at the end of July on flowers of *Spiraea* in Bentley Woods, in early August by sweeping at Burgh Castle, in the middle of July on *Heracleum* flowers at Henley and in the middle of September at Wangford, near Southwold. Stanley Kemp bred a male from *Hyponomeuta cognatella* at Notting Hill, London, in 1902.

17. *claripennis*, Thoms.

Angitia claripennis, Thoms. Opusc. Ent. xi. 1161, ♂ ♀.

A black species with the femora entirely fulvous and tibiae testaceous; the hind tibiae centrally testaceous-stramineous and but slightly infusate at both extremities; ♂ scape somewhat pale beneath; ♀ terebra only just extended beyond the anus. Length, 5–6½ mm.

Thomson says it differs from *A. rufipes* in having the apices of the anterior coxae and whole of their trochanters citrinous, the wings hyaline and the metathoracic sculpture less rugose. Prof. Sigismund Brauns named several examples of this species for me in 1898 and I entirely concur in his determination, though the terebra is but slightly exerted and not, as Thomson leaves one to suppose, nearly half the abdominal length.

This is almost our only species of the present genus which has not already been recorded from Britain, and is one of those referred to as new by me (E.M.M. 1899, p. 209). Hitherto it has only been known from Bästad in Sweden, Belgium in July and August, and France. It is, however, not very uncommon with us, especially in marshy places on the tables of *Angelica*, where I took a series about Lowestoft, at Holbon Marsh, Barnby Broad and Henstead Marsh in August, 1898, and again in 1900 and 1906; elsewhere it has turned up singly at Barton Mills, Icklingham and Brandon in west Suffolk; and Tuck has found it at Aldeburgh. It is doubtless widely distributed for Butler has given me examples from Dorking in Surrey and Elliott from North Berwick, taken in July, 1908.

18. *majalis*, Grav.

Campoplex majalis, Gr. I.E. iii. 462, ♂ (? ♀); cf. Audouin, Hist. Nat. Ins. Nuis. 1842, 181, pl. xviii, fig. 1, ♀. *Limneria majalis*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 150; Bridg.-Fitch, Entom. 1885, p. 107, ♂ ♀. *Angitia Majalis*, Thoms. O.E. xi. 1161, ♂ ♀.

Head but slightly constricted posteriorly with the vertex somewhat broad; palpi stramineous, mandibles centrally flavidous or ferrugineous. Antennae hardly longer than half body in both sexes, with ♂ scape dull fulvous and ♀ scape dark testaceous beneath, flagellar apices subattenuate. Thorax distinctly convex and dull with traces of elongate and subparallel notauli, sternaui half length of mesosternum and apically deeply impressed; metathorax basally nitidulous and very finely punctate; areola not longer than broad, its carinae strong and apically obsolete; costulae strong and entire. Abdomen dull, pubescent and apically compressed; immaculate black, with the sixth segment entire; postpetiole centrally subtumidulous, longer than broad, nearly as long as and double breadth of the petiole; second segment of ♂ double and of ♀ one and a half times as long as apically broad; the third of ♂ elongate and of ♀ subquadrate; terebra half length of body, slightly reflexed. Legs slender and fulvous, with anterior coxae and trochanters of ♂ and sometimes of ♀ flavous or fulvidous, occasionally black; hind coxae and their trochanteral base black, latter apically flavidous; hind femora and tibiae fulvous, with extreme apices of the former and both the apex broadly and a band before base of the latter more or less intensely black, sometimes merely infuscate or obsolete; centre of hind tibiae varies from rufescent testaceous to stramineous white; hind tarsi infuscate with calcaria and basal half of their first joint white. Wings normal and subhyaline with stigma piceous or luteous, never stramineous; radix and tegulae stramineous; areolet subregularly triangular, petiolate or subpetiolate, always distinctly oblique and emitting the recurrent nervure nearly from its extreme apex. Length, 7-7½ mm. ♂ ♀.

Authors appear to have been unable to interpret Gravenhorst's description because he gives his female so small a size that it has—at least in England—been constantly applied to *A. armillata* (by Bridgman) and *A. fenestralis* (by Capron), than both of which it is distinctly larger, usually with fully the seven millimetres accorded to his male by Gravenhorst, whose account of the areolet and postpetiole are very distinctive, applying equally to both sexes of the species as I understand it. The hind tibiae vary considerably in depth of colouration and I consider it quite probable that Thomson had the present insect before him, in spite of his "tibiae posticae haud nigro-binotatae" and "coxis omnibus nigris." It is easily recognised by its large size, straight and elongate external radius, the centrally elevated postpetiole and subcontinuous second recurrent nervure.

It is difficult to say what the older authors understood under the present name, and all their records must be accepted with reserve, though I fancy most or all those of allied species from *Hyponomeuta*-hosts should be placed here. Germany, Parma, Genoa, Piedmont and Netley in Shropshire from May to September, rarely on flowers (Gravenhorst); bred from *Plutella porrectella*, a *Tortrix* and from a *Nematus* larva, according to Brischke, who describes the cocoon as "eliptisch, dünnwandig, etwas

glänzend, hellbraun mit dunkler schmaler Mittelzone, etwas wollig, oder aussen ganz weisswollig." Giraud records it from *Eupithecia debilitata*, *Alucita xylostella* and Cannes larvae of *Emydia grammica*. Gaulle also names as hosts *Plutella maculipennis* and *Coscinia striata*. It is found in Belgium during May, July and August, and is apparently rare in both Sweden and Thuringia. In Britain, one male, "which it is convenient at present to call" *majalis*, Grav., has been bred from galls of *Cynips Kollari* (Entom. 1880, p. 256), and other somewhat vague records are from *Botys verticalis* (lib. cit. 1881, p. 140), *Vanessa atalanta*, *Hecatera serena*, *Eupithecia indigata* and *Xylopora Fabriciana* in Devon by Bignell; Holgate in Yorkshire by Bairstow, Lands End district by Marquand and as very common in Norfolk by Bridgman. In my own experience this is the parasite *par excellence* of the genus *Hyponomeuta*; Mr. O. E. Janson bred both sexes on 15th and 16th July, 1891, from *Hyponomeuta padella* feeding on apple trees in his Highgate garden: Dr. McDougall sent me a male from a species of *Hyponomeuta* on apple in 1910; Ray Hardy bred both sexes from *H. padella* commonly at Macclesfield during July, 1907; Charbonnier bred at Bristol in 1908, and Martineau at Birmingham in 1906, females from the above species of host; and in 1908 Mr. F. C. Hinde sent me a dozen of both sexes, again from this host, bred at Norwich. It is not often taken on the wing: Capron found it at Shere, Adams early in June at Lyndhurst and Johnson in Armagh; I took several males and saw the female on the flower heads, both faded and coming into blossom, of *Daucus carota* by the sea at Felixstowe, as late as 23rd October, 1899; and single examples have occurred to me during the second half of May in the Bentley Woods and Harleston in Suffolk.

19. *albonotata*, Bridg.

Limneria (*Angitia*) *albonotata*, Bridg. Trans. Ent. Soc. 1889, p. 427, ♂ ?.

A black species; the front legs testaceous-flavous, with coxae and trochanters pale stramineous; the hind ones with the coxae black, femora red, tibiae and tarsi dead black with centre of former broadly and base of latter pure white; metathorax dull and closely punctate throughout; antennae very slender and hardly shorter than body; ♂ scape pale beneath; ♀ terebra not exerted. Length, 7-7½ mm.

Extremely closely allied to *A. majalis* but at once known by its filiform and elongate flagellum which in both sexes is very slender and hardly shorter than body, by the stramineous (by no means piceous, as described by Bridgman) stigma, the dead black extreme base and apex of the clear white hind tibiae; the male has the basal nervure more curved before the stigma, and the female terebra does not extend beyond anus.

I possess two pairs in Dr. Edward Capron's collection, captured by him about Shere in Surrey; and these I believe to be the only examples yet known.

20. *fenestralis*, Holmgr.

Campoplex majalis, var. 4, Gr. I.E. iii. 464, ♀. *Limneria fenestralis*, Holmgr. Sv. Ak. Handl. 1858, p. 59; Brisch. Schr. Nat. Ges. Danz. 1880, p. 150; Bridg.-Fitch, Entom. 1885, p. 108, ♂ ? . *Angitia fenestralis*, Thoms. O.E. xi. 1156, ♂ ? .

A black species with hind tibiae and underside of scape white, the former black-marked and their femora basally black. Head transverse

and not broad; face transverse, cheeks somewhat elongate; palpi and most of mandibles flavidous. Antennae longer than half body and apically subattenuate, with underside of scape in both sexes nearly entirely or at least apically stramineous. Thorax cylindrical; metathoracic areae distinct, with costulae always strong and areola usually apically incomplete. Abdomen narrow and in ♀ apically subcompressed; postpetiole subconvex, parallel-sided and about as long as broad; second segment distinctly longer than broad, third subquadrate; terebra half length of abdomen and only a little curved. Legs fulvous; anterior coxae and trochanters stramineous, with the former usually basally black; hind coxae and tibiae black, the latter at their base and broadly in their centre stramineous-white; hind femora always basally, and rarely also apically, nigrescent; their tarsi infusate, with joints basally paler. Stigma and tegulae stramineous; outer radial abscissa apically curved and a little longer than the basal; areolet petiolate and regularly triangular, emitting recurrent nervure at or immediately beyond its centre; nervellus subpellucid. Length, about 5 mm.

This is the typical species of a difficult group, which differs from the rest of the genus in having the head distinctly constricted behind the eyes and usually the scape pale beneath; the present and two following species are distinguished from the remainder of this group by having the alar areolet regularly triangular, emitting the recurrent nervure almost exactly from its centre, by having the anterior trochanters entirely stramineous or citrinous, by their length of 5 mm. and by the terebra being about half the abdominal length. *A. fenestralis* is known by having its tibiae and slender femora fulvous, the hind femora always basally nigrescent, the hind tibiae nearly pure white with their apices broadly and a mark before their base quite black, by the stramineous stigma, the apically curved outer radial abscissa being little longer than the inner, by its subelongate cheeks and distinct costulae.

It is supposed to be one of the commonest of all Ichneumonidae throughout the whole of Europe, as Holmgren says "a primo vere usque ad autumnum"; but there are few records, it has only been bred from *Hydrellia griseola* (Brischke), *Pterophorus microdactylus* and the genera *Acalla* and *Gracilaria* (Gaulle); and in the course of fifteen years I have not captured fifty specimens in England. It was first known to be indigenous from Gravenhorst's mention of it from Netley in Shropshire in 1829; and it is recorded from Cornwall, Devon, Norfolk, etc. As hosts have been instanced *Bolys verticalis* and *Depressaria hypericella* (Entom. 1881, p. 140), *Choreutes scintillulana* (Bridgman), *Tortrix costana* and *Xylophora Fabriciana* (Bignell). I possess a hundred specimens, about half of which were reared by Barrett from *Scirioris abscissana*, Grav.; by Ash from *Colophora pyrrhulipennella* at Skipworth in Yorks; by Blair on 28th October, 1903, from a Tortricid in the curled leaf of *Ranunculus sceleratus* at Hampstead, London, and both sexes from larvae feeding in privet berries at Wilmslow in Cheshire; and by Bankes on 21st-23rd June, 1901, from larvae of *Hypercallia Christiama*, L., at Ashford in Kent, with a score from *Gelechia tetragonella*, Stn., in the Isle of Purbeck, Dorset, on 11th July and between 6th June and 10th July. The cocoon is $5\frac{1}{2}$ mm. long by $1\frac{1}{2}$ mm. broad, cylindrical and clear brown, with a narrow white central girdle, the whole densely covered by fine white interwoven strands. I have seen it from Sussex (Esam), Cornwall

(Marshall), Herts (Piffard), Hereford (Verbury), Taunton and Bath (Charbonnier), Kilmore in Ireland (Beaumont), Surrey (Butler and Capron), Kent (de la Garde), Hampshire (Adams), Giffnock near Glasgow (DalGLISH) and St. Kilda (Waterston). It has occurred to me in the Isle of Wight, the New Forest, at Salisbury, Groveley in Wilts, in Essex, Cambridgeshire, Suffolk, Norfolk and Lincoln; the males are first on the wing on 23rd April, the females not before the middle of May: they are hardly ever attracted to flowers, though I believe I have taken them on *Angelia* and Alexanders; as a rule one finds them by casually sweeping rough herbage, reeds, marram grass, etc., often at dusk, and once I took a female in the pitch dark in this way; it was attracted to light at Monk Soham in the middle of August, 1907, but I do not find it upon house windows, as others have stated; it becomes rarer in August and is hardly ever seen in September, the 19th of which month is my latest date of capture.

21. *chrysosticta*, Gmel.

Ichneumon chrysostictus, Gmel. S.N. 1790, 2721. *Campoplex chrysostictus*, Gr. I.E. iii. 522, ♂ ♀, excl. varr.; Ratz. Ichn. d. Forst. i. 96, ii. 83, iii. 86, ♂ ♀. *Limmeria chrysosticta*, Holmgr. Sv. Ak. Handl. 1858, p. 60, ♂ ♀. *Angitia chrysosticta*, Thoms. O.E. xi. 1157, ♂ ♀.

Black with the femora and tibiae red, the hind or posterior tibiae apically and before their white base black and centrally broadly stramineous; antennal scape pale beneath. Length, about 5 mm.

Too closely allied to the last to need a detailed description, and agreeing with it in the above particulars; therefrom it is at once known by its immaculate fulvous hind femora, subinfusate alar stigma, distinctly short cheeks, in the slightly emarginate apex of the sixth ♀ segment, and often laterally rufescent third or second and third segments. The eyes in life, always beautiful objects in the Ichneumonidae, are particularly brilliant in this species, metallic bronze-green—"oculis vita viridi-nitentibus," as Gravenhorst says; also I have noticed that the sixth and seventh ♀ segments are white spotted, though no trace of this is found in dried specimens.

This species is said to be as widely distributed, though decidedly less common, than the last one on the Continent, where records of its breeding are not rare. In pretty well every case, however, no reliance can be placed on those before 1887 when the specific characters were first definitely understood; and I think most of at least the *Hyponomeuta* records refer to *A. majalis*. Raised from *Papilio urticae* (Grav.); by Ratzeburg from *Tinea cognatella*, *T. padella* and *T. malinella*, from *Tortrix resinana*, *Tinea syringella*, a species of *Psycha* and on 20th April from *Nematus* galls on wild rose; Gaulle adds another Tenthredinid host-genus, *Lophyrus*; and Dours says (Cat. Hym. France, 1874, p. 62) "des galles du Saule Marsault contenant le *Nematus salicis*." Giraud gives *Argyresthia nitidella* and adds it is "parasite des fourreaux de la *Talaporja pectinella* dans environs de Paris" (Ann. Soc. Fr. 1877, p. 403).

In Britain we have but three references to this species: bred from *Hyponomeuta padella* (Entom. 1884, p. 67); captured at Earlham in July (Bridgman); and bred in south Devon from *Hyponomeuta evonymellus* on 14th July and from *H. padellus* on 16th July (Bignell). I have seen it

from Nunton in Wilts (Marshall), Reigate (W. Saunders), and Lyndhurst in May and June (Adams); Chapman bred a female on 10th June from *Psyche intermediella*, found at Bournemouth on *Erica*; and Brischke describes the cocoon as "cylindrisch, schwarz oder braun, weiss besponnen." It cannot be generally common, for I took only nine examples, on *Angelica*, *Heracleum*, *Chaerophyllum* and *Foeniculum* flowers, between 1895 and 1904 in Cambridge and Suffolk, where Tuck has several times met with it near Bury. What then was my surprise at finding it in the utmost profusion on the windows of Monk Soham House when I first came here in 1904! It has occurred annually since that time, I pinned over eighty specimens and then tired; the male occurs from 23rd May to 10th September, though not at all in July, and it is fully three-quarters rarer than the female, which has been taken from 14th May to 11th October, is rarest in July, and upon two occasions I have noted it on 27th December; it not infrequently flies to lamps, always about 9 p.m.; I suspect it of preying upon *Endrosis fenestrella*, the common clothes moth.

22. *lateralis*, Grav.

Campoplex lateralis, Gr. I.E. iii. 467, ♀. *Limneria lateralis*, Bridg.-Fitch, Entom. 1885, p. 106, ♀. *Angitia lateralis*, Thoms. O.E. xi. 1157, ♀.

A black species with red legs, exactly like the last two in structure, in the regularly triangular areolet emitting recurrent nervure from its centre, the entirely pale anterior trochanters, narrow head and pale underside of the scape. Length, 5 mm. ♂ ♀.

The female differs from the two preceding in having the terebra only one-third in place of half the length of the abdomen, which bears a very much more definite lateral mark on the third and rarely also on the second segment, its stigma is somewhat narrower, but it is recognised at once by the unicolorous fulvous hind tibiae with no black markings. The male has not hitherto been known, and was doubtless mixed with other species; it is the commoner sex in Britain and agrees in every way with those of the two last species, excepting in its strong abdominal marks and unicolorous hind tibiae and femora.

Very little seems to be known of this species, which is recorded only from Silesia and Piedmont (Gravenhorst) and Esperöd in Sweden (Thomson). Desvignes included it in his 1856 British catalogue, but our only record is by Bignell "captured at Cornwood, 21 May; Bickleigh, 19 June," in south Devon. It is not very rare with us and I possess a score of specimens, found at Reigate by Saunders, Felden by Piffard, Tuddenham Fen in August by Elliott, Tostock by Tuck; Chapelizod, Dublin, on 10th May by Stanley Kemp; and bred by Chapman from *Fumica casta* at Lugano. It has occurred to me in the Isle of Wight at Ryde, in Essex at Gosfield, in Norfolk I took the typical male in Wroxham Broad on 14th June, 1901, with others in Surlingham marsh; and in Suffolk it is found on reeds at Covehithe, carrot flower at Monks Soham, in Tuddenham Fen, Henstead marsh, Beccles, Mildenhall and in August sitting on grass stems at Brandon, always in very marshy spots.

23. *cerophaga*, Grav.

Campoplex cerophagus, Gr. I.E. iii. 470, ♂ ♀, excl. var.; cf. Goureau, Ann. Soc. Fr. 1868, Bull. p. xvi. *Limneria majalis*, Holmgr. Sv. Ak. Handl. 1858, p. 60, ♀. *L. cerophaga*, Bridg.-Fitch, Entom. 1885, p. 106. *Angitia cerophaga*, Thoms. O.E. xi. 1158, ♂ ♀.

A black species with the palpi and centre of mandibles flavidous. Antennae entirely black, with scape immaculate. Metathorax basally dull, with costulae wanting. Abdomen immaculate black, with terebra not quite half its length. Anterior legs testaceous with coxae mainly black, and trochanters stramineous; hind coxae and trochanters black, with apices of latter flavous; hind femora rufescent, their tibiae whitish with apices and marks before base nigrescent; tarsi piceous, basally pale. Stigma piceous flavous and tegulae stramineous; apical radial abscissa distinctly longer than basal; lower angle of discoidal cell apically acute; areolet not regularly triangular, emitting recurrent nervure but shortly before its apex. Length, 5 mm.

This species is very similar to *A. fenestralis*, but the face is somewhat narrower, the metathorax is not basally nitidulous, the costulae are wanting, the cheeks and terebra are shorter, and the scape is black. From the last three species it differs in having the areolet irregular and emitting the recurrent far beyond its centre, the outer radial abscissa obviously the longer, and the discoidal cell acute below; in all these characters and the very pale, black-banded hind tibiae it agrees with the four next species, though distinct from them all in the slender, subuliform flagellum and from most of them in the excised seventh ♀ segment.

It was thought by Thomson to be a prevalent species; it is found on flowers in the middle of July in Germany, during July and August in Belgium, in July in Holland and, in France, Gaulle says it is known to attack *Larentia bilineata*, one of our commonest British moths. It was also reared by Giraud in 1877 from *Eupithecia oxycetrata*, probably in Austria; though Goureau's record from the Tenthredinid host *Emphytus melanopygus* (*lib. cit.*) doubtless refers to some species of *Holocremna*. Bridgman entirely failed to find this species in Norfolk and I have had the same experience in Suffolk, and possess but few specimens. These were captured in Denny Wood in the New Forest in June, in Marvell Copse near Newport in the Isle of Wight and at Louth in Lines. about the same time; at Carlisle (Tomlin), Lyndhurst (Adams), Cornworthy (Marshall), Greenings in May (Saunders), and Devonport (de la Garde). Bignell also twice found it in Devon at Bickleigh in June and Crabtree in early September. It has been recorded as bred from *Gracillaria stigmatala* (Entom. 1881, p. 140); Banks has given me a male bred in south Dorset on 6th July, 1898, from *Epischmia Banksiella*, Rds. and a couple of females in the Isle of Purbeck on 5th July, 1896, from *Depressaria atomella*, Hb. It is doubtless recorded in error (Proc. S. Lond. Ent. Soc. 1896, p. 81) from *Laverna epilobiella*, Schr.

24. *cylindrica*, Brisch.

Limneria cylindrica, Brisch. Schr. Nat. Ges. Danz. 1880, p. 159, ♂ ♀; cf. Bridg.-Fitch, Entom. 1885, p. 106. *Angitia tenuipes*, Thoms. O.E. xi. 1158, ♀.

A slender dull black species, with the head hardly constricted posteriorly; palpi and manibles flavous. Antennae about half length of

body, with scape entirely black. Thorax cylindrical; metathorax with strong costulae and areola, the latter entirely wanting apically. Abdomen cylindrical and immaculate black; basal segment hardly as long as hind coxae and trochanters; postpetiole not short, laterally rounded; second segment longer than broad, third quadrate; terebra as long as half abdomen. Legs fulvous, with coxae and base of hind trochanters black; hind tibiae not paler red, occasionally infuscate or black at their apices and before base. Stigma piceous-stramineous; radix and tegulae flavous; areolet oblique, irregular and emitting recurrent nervure from its apical third; apical radial abscissa hardly curved; nervellus entire. Length, $3\frac{1}{2}$ –5 mm.

Agrees only with *A. cerophaga* in its slender and filiform flagellum; it is very similar to *A. chrysosticta* but is smaller, more slender, with the second segment and postpetiole nearly half as long again as broad, the costulae distinct and scape black. Thomson's statement that the "third" segment is half as long again as broad is a misprint for second; Mr. Smits van Burgst has been good enough to send me a Dutch female of *A. tenuipes*, which agrees in every way with one of the Freshwater females given by Bridgman to Dr. Capron and labelled by him *cylindrica*, Brisch.; its length is $4\frac{3}{4}$ mm.

Sweden, Prussia and one of the commonest species of the genus in Thuringia. It was introduced as British by Bridgman (Trans. Ent. Soc. 1884, p. 428) "Bred by Mr. W. H. B. Fletcher from *Gelechia inopella* from Freshwater, Isle of Wight, beginning of October, 1883" (repeated at Entom. 1884, p. 70). Brundall in Norfolk (Bridg.). I have specimens from Chatham in May (de la Garde), Greenings in June (Saunders), Lyndhurst in July (Adams), Tostock (Tuck), Shere (Capron), Bishops Teignton and Cornworthy (Marshall); Sich bred it in 1907 from the Veronica plume, *Stenoptilia pterodactyla*, at Chiswick; Banks raised both sexes early in July, 1901, from larvae of *Laverna conturbatella*, Hb., at Ashford in Kent; males in the middle of May, 1899, from *Aproaerena vinella*, Bnks., near Brighton in Sussex; both sexes on 5th–14th July, 1901 (with *Hemiteles monozonius*, Gr.—cf. Ichn. Brit. ii. 139) from *Acrolepia granitella*, Tr., at Corfe Castle in Dorset; and Whittle found a female had emerged on 21st May, 1902 (with an *Apanteles* on 25th July) from cases of *Proutia betulina*, Zell., collected at Eastwood in Essex. It is a common species on the wing and I have captured it on flowers and by sweeping, more usually during August, at Salisbury, in the New Forest, Norfolk, Cambridge, Essex and Suffolk.

25. *armillata*, Grav.

Campoplex chrysostictus, var. 2, Gr. I.E. iii. 524, ♂ ♀. *C. armillatus*, Gr. l.c. 514, ♂; Ratz. Ichn. d. Forst. i. 95, iii. 85, ♂ ♀. *Limneria armillata*, Holmgr. Sv. Ak. Handl. 1858, p. 61; Bridg.-Fitch, Entom. 1885, p. 108, ♂ ♀. *Angitia armillata*, Thoms. O.E. xi. 1158, ♂ ♀.

Black with the tibiae and somewhat stout femora fulvous; hind tibiae whitish with their apices and a mark before their base black; calcaria elongate. Length, 5–6 mm.

This species is distinct in its short head with the ♀ face slightly and the vertex more strongly constricted, the very short cheeks; in the coarctate thorax with the metathorax posteriorly rugosely punctate, areola

transverse and costulae stout; in the dull pubescent abdomen, which sometimes has the third or also the second and fourth segments red-marked; in the apically straight radial nervure and somewhat narrow stigma. It shares with *A. maculata*^{*} the excised seventh segment, elongate flagellum, with flavous coxae and underside of scape. It differs from *A. cerophaga* in its elongate, stout and attenuate flagellum, though agreeing in the excised seventh ♀ segment and irregular areolet.

Apparently uncommon in Britain, where I have seen only some dozen examples, though on the Continent it is widely distributed and said to be common; Silesia, Germany, Sweden, France, Belgium in July and August, and Holland in June. Hartig reared it from *Geometra fulva* and both Ratzeburg and Brischke record it from such *Hyponomeutae* as *H. malinella* and *H. variabilis*; Holmgren also gives Tineid hosts and Giraud species of *Depressaria*, to which Gaulle adds *Plutella maculipennis* and *Tephroclystia linariata*. It has not hitherto been bred in England, where Bridgman thought it not uncommon in Norfolk, and Bignell captured it at Laira in Devon on 16th July. I have specimens taken by Piffard at Felden and Marshall at Botusfleming, Nunton and Bishop Teignton; in June, 1899, Chapman sent me a female which had emerged from a small macrolepidopteron, found feeding on *Aster tripolium* at Leigh in Essex, and on 19th February, 1904, another emerged from *Thera juniperata*, sent me by Cross. My own captures are distinctly meagre and extend from 14th June through July and August to 5th September, when the only red-marked example I have seen occurred in Henstead marsh near Lowestoft; the others are from Tuddenham Fen, Wherstead on *Heraclium*, and Alderton on fennel flowers in Suffolk; Wroxham Broad in Norfolk, Burwell Fen in Cambs. on whitethorn blossom, and Wilverley Inclosure in the New Forest.

26. tibialis, Grav.

Campoplex tibialis, Gr. I.E. iii. 468, ♀. *Limneria tibialis*, Bridg.-Fitch, Entom. 1885, p. 106, ♀. *Angitia tibialis*, Thoms. O.E. xi. 1159, ♂ ♀.

A black species with the legs red-marked; the hind tibiae pure white with a band before their base, and their apices more broadly, black; abdomen with the seventh ♀ segment subexcised. Length, 4 mm.

It is very similar to *A. fenestralis* in its pedal colouration, but the pale markings are purer white, the terebra is nearly twice the length of postpetiole and the anterior coxae are nearly totally pale. This and the next two species differ from the last five in having the flagellum slender though not filiform, the abdomen black with its ventral plica flavous or whitish, the terebra short, the seventh segment entire or at most subemarginate;

* *Angitia maculata*, Grav.

Campoplex maculatus, Gr. I.E. iii. 536, ♀; *Limneria maculata*, Bridg.-Fitch, Entom. 1885, p. 205; *Angitia maculata*, Thoms. O.E. xi. 1159, ♀.

Black, shining and subglabrous with the abdomen a little longer than terebra, petiole centrally whitish, the following segments apically flavous, and the sixth emarginate; legs mainly flavous; thorax with pleurae smooth and costulae distinct. Length, 5 mm. ♂ unknown.

I here mention this species because it figured as British in both Marshall's 1870 and 1872 catalogues. There are, of course, no subsequent indigenous records, for only two females appear to be known, recorded by Gravenhorst in 1829 "*Feminam unicam, circa Florentiam captam, a Sanvitale ad me transmissit*" and Thomson in 1887 "*Professor Gasperini har funnit denna art vid Spalato i Dalmatien.*"

in the distinctly white hind tibiae with the apices and subbasal mark black; in the stramineous stigma, somewhat strongly constricted vertex and small size of but 4 mm.

This species has been found in Silesia, Sweden, France, Holland, etc., and has been bred by Mocsáry from *Caradrina lenta*. In Britain it seems to be rare and we must not put too much faith upon its records from *Gracilaria phasianipennella* (Entom. 1881, p. 140), *Coleophora albiparsella* (*lib. cit.* 1883, p. 66) or upon that from *C. gryphipennella* (*lib. cit.* 1884, p. 70); Bridgman says he took it at Norwich and adds as hosts *Coleophora lincollella* and *Sceamnerdamia oxycanthella* in 1894. I only possess a dozen examples, of which the males were found at Wicken in Cambridgeshire and Louth in Lincolnshire during June, and the females on reeds in salt marshes about Southwold, at Rishangles and Tuddenham Fen in Suffolk, during August and September; both sexes occurred to me on Clare Island off the west Mayo coast of Ireland during July, 1910. Rev. C. D. Ash bred two males on 22nd August, 1900, from *Eupithecia indigata* at Selby in Yorkshire; Luff and Tutt both raised others in June from *Luffia lapidella*, the former in Guernsey.

27. *virginalis*, Grav.

Campoplex virginalis, Gr. I.E. iii. 472, ♀. *Limmeria virginalis*, Bridg. Trans. Ent. Soc. 1882, p. 150; Bridg.-Fitch, Entom. 1885, p. 106, ♀. *Angitia virginalis*, Thoms. O.E. xi. 1160, ♂ ♀.

Black with the legs red-marked, the hind tibiae whitish with a band before their base and their apices black. Head posteriorly constricted; scape piceous beneath; metanotal areola transverse, with costulae wanting; postpetiole subquadrate, second segment a third longer than broad, the third hardly longer than broad; seventh segment entire; terebra as long as postpetiole. Length, nearly 5 mm.

It agrees with *A. tibialis* in its short terebra, pale ventral plica and slender though attenuate flagellum, but it is distinct in its shorter terebra, entire seventh segment and quadrate postpetiole with distinctly prominent spiracles; it is very similar to *A. fenestralis* though much smaller and known by the apically truncate clypeus, flagellar structure, basally dull metathorax and irregular areolet.

By no means an uncommon species with us, though somewhat doubtfully distinct from the next, and said by Schm. to be uncommon on the Continent, where it is recorded from Germany, Sweden, and Van Burgst has taken it in August at The Hague. Bridgman introduced it as British (*loc. cit.*) on a specimen, which he there associated with *A. gracilis* (separated at Trans. Ent. Soc. 1884, p. 427), found in the vicinity of Norwich. I have examples captured by Saunders at Deal in May, 1872, by Beaumont at Blackheath in September and Tuck at Aldeburgh in the middle of the same month. My own specimens come from all over Suffolk, on birch, *Angelica*, *Heracleum* and other umbelliferous flowers, usually in marshes; from Wicken in Cambs and Oxshott in Surrey; between 5th May when the first male is abroad, and 1st October, when I swept the last female off reeds in Covehithe Broad; once I shook a female out of a *Boletus* fungus at Ipswich as late in the year as 9th November, 1895, but this seems exceptional.

28. *gracilis*, Bridg.

Limneria gracilis, Bridg. Trans. Ent. Soc. 1884, p. 427; Bridg.-Fitch, Entom. 1885, pp. 106, 108, ♂ ♀ (nec Brisch. Schr. Nat. Ges. Danz. 1880, p. 150, ♂). *Angitia gracilis*, Schm. Opusc. Ichn. 1778, ♂ ♀.

Head with the vertex transverse, and somewhat constricted behind the eyes; clypeus not basally discreted; teeth of the flavous mandibles of equal length. Antennae shorter than body, with first flagellar joint slightly longer than second, and sometimes the scape apically flavous. Thorax cylindrical and much longer than high, with the mesopleural punctures running into sinuate aciculation and their speculum nitidulous; metathorax elongate, with discal areae complete; areola elongate, of variable length, and apically incomplete. Abdomen slender and immaculate black; postpetiole about double breadth of, and about a third shorter than, petiole, laterally parallel-sided in ♂, slightly rounded in ♀; second segment a third longer than broad; terebra a sixth of the abdominal length. Legs with front coxae of ♀ and anterior of ♂, with their trochanters except base of hind ones, flavous; femora fulvous with hind ones often infusate at both extremities; anterior tibiae stramineous, hind ones white with their apices and a subbasal mark black. Stigma luteous or piceous; tegulae stramineous; areolet petiolate or subsessile, emitting recurrent nervure beyond its centre; nervellus entire. Length, 3.5-nearly 5 mm.

"It differs from *L. virginalis*," says Bridgman, "in its smaller size, and in having the hind femora generally more or less fuscous at the base and apex, the front coxae of the female and front and middle coxae of male yellow; the post-petiole is slender, rather longer than wide, in *virginalis* it is subquadrate with distinctly projecting spiracles; the areola of the metathorax is long and narrow, in the other species it is transverse." Bridgman referred his species to Gravenhorst (I.E. iii. 511, ♂), but that is now recognised as belonging to the genus *Nemeritis*. Schmiedeknecht quotes (Opusc. Ichn. 1085 & 1778) the latter author under both!

Gaule, who leaves it in *Limnerium* in 1908, says it has been raised from *Choreutes* and *Acrolepia assectella* in France. Bridgman described both sexes from Wimbledon, and both Moushold and Earham near Norwich, adding that two batches had been bred from *Gracilaria stigmatella*. Subsequently Bignell in Devon and Fletcher of Worthing both bred it from *Coriscium cuculipennellum*, the latter on 14th August. It is rarer with us than the last species, and by no means easy to distinguish. I have only some half dozen examples, besides a full series taken at Shere by Capron; these are from sallow in Wicken Fen in Cambs., and several by sweeping at Winterton in Norfolk during June; from reeds at Southwold at the end of September, when Tuck took it in Finborough Park, also in Suffolk; and, in the middle of June, Tomlin has sent it me from the Point of Aire.

29. *vestigialis*, Ratz.

Campoplex vestigialis, Ratz. Ichn. d. Forst. iii. 1852, 88, ♂ ♀. *Limneria vestigialis*, Bridg.-Fitch, Entom. 1885, p. 104; cf. Proc. Nat. Hist. Soc. Glasgow, iv. p. 108 (nec Brisch.). *L. flexicauda*, Holmgr. Sv. Ak. Handl. 1858, p. 73; Bridg.-Fitch, Entom. 1885, p. 107, ♂ ♀. *Angitia vestigialis*, Thoms. O.E. xi. 1166, ♂ ♀.

A black and somewhat squat species. Head a little constricted behind the eyes; mandibles and peristomium somewhat large, with the former

pale; clypeus apically truncate. Antennae immaculate. Thorax not stout; metanotal costulae obsolete or wanting; areola apically incomplete. Abdomen black with the postpetiole quadrate and parallel-sided, with prominent spiracles; second segment of ♀ hardly longer than broad; seventh segment not excised; terebra longer than basal segment and extremely strongly curled over the anus. Legs with femora and tibiae red, the hind ones basally and their tibiae also sometimes apically infusate, latter not at all centrally whitish; all the trochanterelli, anterior trochanters and apices of their coxae pale, often flavous. Areolet small and oblique, at least in ♂ sometimes wanting. Length, 4–5 mm.

Known by its small, strongly oblique and elongately petiolated areolet, which is sometimes wanting, by the strongly reflexed terebra, which is a little longer than half abdomen and emitted from centre of the venter, and by the pale coxal and trochanteral colouration. In some of my specimens the costulae are present, in others absent; and the variability of the areolet renders nugatory any claims of specimens of this group to generic rank on the entirety of this feature.

It was first bred in Germany by its author from galls of the Tenthredinid *Nematus Pedunculi* on 3rd June, 1849, and of *N. Saliceti* on 27th May, 1850. Although these are partly ascribed to Brischke, I can hardly think that all his specimens, which seem to differ in their "basis der Hintertibien immer gelb" (Schr. Nat. Ges. Danz. 1880, p. 164) can be ascribed to this species, for he raised them from such diverse hosts as pupae of *Tortrix laevigana* and *Retinia resinana*, larvae of *Nematus Valisnieri* and *Phyllotoma microcephala* in Prussia. That it is attached to sawflies is proved by Thomson who raised it from salix-feeding species in Sweden. Holmgren's species was described from grassy places in Southern Lapland, of infrequent occurrence, and his name does not appear to have been noticed elsewhere, though *A. vestigialis* is recorded from France (Gaulle) and has been recently bred about Breda in Holland during May from *Pontania Valisnieri* (Burgst). I venture to synonymise Holmgren's species with the present since two females from Shere, named *Limneria flexicauda* by Capron, certainly belong to it. It has long been known in Britain under the broader genus, though Ratzeburg's name was not introduced until 1881 (Trans. Ent. Soc. p. 161), and is probably erroneously recorded as bred from *Peronea hastiana* by Perkins (Entom. 1883, p. 66) at Wootton-under-Edge. On 31st July, 1911, I caught three females and saw others flying round and alighting upon the numerous galls of *Pontania proxima*, Lep., on willow in my Monk Soham garden; they were quite doubtless ovipositing in these galls, though I failed to witness the act. Bignell gathered some of the same galls (*Nematus gallicola*) in Devon on 25th August, 1884, and bred this parasite from them on 11th of the following October (Entom. 1885, p. 152); and on a card supporting *N. gallicola*, Westw., in Mus. Brit., Marshall has noted "Its parasite is *Limneria curvicauda*, Holmg." The parasite does not always emerge the same year; for, from some of the above galls, gathered on 19th October, 1911, I bred a female *P. proxima* and a male *A. vestigialis* to-day, 24th April, 1912. Piffard also found it at Felden and Johnson in Ireland.

30. *curvicauda*, Holmgr.

Limneria curvicauda, Holmgr. Sv. Ak. Handl. 1858, p. 74; Brisch. Schr. Nat. Ges. Danz. 1880, p. 164, ♂ ♀; cf. l.c. 1892, p. 45. *Angitia curvicauda*, Thoms. O.E. xi. 1166, ♂ ♀.

Black with the mouth pale, and scape pale-marked beneath. Metathoracic costulae somewhat distinct and areola apically incomplete. Abdomen with second segment of ♀ not, and of ♂ hardly, longer than broad; terebra almost shorter than basal segment. Femora dull red, gradually becoming more broadly black basally beneath; anterior trochanterelli citrinous; tibiae dull testaceous with the hind ones subbasally and more broadly apically black. Length, nearly 5 mm.

It is said to differ from *A. vestigialis* in its small mandibles and peristomium, in the stouter conformation of both sexes, in the areola extending further towards the metathoracic base, in the distinctly black-marked femora and hind tibiae, in the shorter, stouter and less strongly curled terebra and not at all exerted ♂ valvulae.

It is rarer in Lapland than *A. vestigialis* and Förster found it in Switzerland; it is also recorded by Gaulle from France; but our claims to it appear to rest solely upon Bignell's Devon record that he bred it on 11th October from the pupa of *Nematus gallicola* (Trans. Devon. Assoc. 1898, p. 492). I have not seen it and suspect this record to apply to the last species. Brischke says "Gehört wohl zu *C. vestigialis*, Rtzbg. Cocon elliptisch, dünnhäutig, glänzend, hellbraun mit hellerer Mittelzone."

31. *rufata*, Bridg.

Limneria rufata, Bridg. Trans. Ent. Soc. 1884, p. 429; Bridg.-Fitch, Entom. 1885, p. 206, ♂ ♀. *Angitia rufata*, Thoms. O.E. xi. 1887, p. 1165, ♂ ♀.

Black with the vertex narrow, especially behind the eyes, and palpi and mandibles pale flavous. Metanotum with all its areae and costulae distinct and entire; areola pentagonal and hardly longer than broad, apically subincomplete. Abdomen with apical margin of the not transverse second segment, whole of third and the fourth to beyond its centre, clear red; postpetiole subparallel-sided, hardly a third longer than broad and much shorter than the subbasally a little explanate petiole; second segment very little longer than broad; terebra about a third of the abdominal length. Legs with the somewhat slender femora and not slender tibiae red; all the trochanters stramineous, with hind ones basally black on their inner side; the anterior coxae apically and extreme base of hind tibiae flavous, the latter and their tarsal joints sometimes slightly infusate apically. Areolet usually petiolate with the outer nervure subpellucid below, though never wanting, emitting recurrent nervure beyond its centre. Length, 4-5 mm.

The type, which I have examined at Norwich, agrees with *A. vestigialis* in having the thorax somewhat slender, the second segment hardly longer than broad with the seventh not excised, the hind tibiae not centrally whitish, terebra longer than basal segment and the areolet oblique; but it differs in the mandibles and peristomium being distinctly small, the abdomen centrally broadly red and the terebra not reflexed. Bridgman thought it allied to *Limnerium cognatum*, Brisch. (Schr. Nat. Ges. Danz.

1880, p. 164), which has not been yet relegated to the present genus and is not known to be British.

It was described from examples of both sexes, bred by C. J. Boden and W. Fletcher from *Choreutes scintillulana* in Britain; elsewhere Thomson alone has found it at Börringe in Sweden. I have a pair, probably co-types, in Capron's collection from Surrey; but the species is rare with us and I possess only two males, captured by Miss Chawner in the New Forest and by Bignell at Bickleigh in August, 1883; with a single male, taken by W. H. Tuck on the 3rd of October, 1900, at Bungay in Suffolk, probably upon the flowers of wild carrot.

32. *interrupta*, Holmgr.

Limneria interrupta, Holmgr. Sv. Ak. Handl. 1858, p. 62; Brisch. Schr. Nat. Ges. Danz. 1880, p. 152; Bridg.-Fitch, Entom. 1885, p. 107, ♂ ♀. *Angitia interrupta*, Thoms. O.E. xi. 1162, ♂ ♀.

A black species with the anterior legs red, their coxae apically and trochanters whitish; hind legs black with the femora entirely red, and both the centre of tibiae broadly and whole calcaria white; terebra exactly as long as basal segment or fully a third of the abdomen, nearly straight; antennae of both sexes slender, exactly filiform and subelongate. Length, 5 mm.

This species has precisely the same facies and structure as *A. exareolata*, though with the petiolate areolet entire and the black hind tibiae broadly stramineous centrally; from the three following species with gibbulous thorax and elongate calcaria, this may be known by its distinct alar areolet, somewhat narrow stigma, elongate apical radial abscissa, the acute lower angle of the discoidal cell, oblique and petiolate areolet, centrally broadly white hind tibiae with long calcaria, somewhat strongly constricted vertex, and slightly narrow face, by the terebral length and wanting metanotal costulae.

A species of wide distribution, and in Sweden of average frequency during the middle of August; France, Belgium in June and Holland in July; Brischke bred both sexes from *Scopula crataegella* in Prussia. It was introduced as British by Fitch (Entom. 1884, p. 67) on specimens raised by Elisha from *Phitheochroa rugosana* and Fletcher of Worthing bred it at the same time (*l.c.* p. 70) from *Eupaecilia udana*. It is quite common with us; Lands End (Marquand), common in Norfolk and bred from *Peronea maccana* (Bridgman), captured at Exminster on 3rd September and bred from *Taenioctampa stabilis* on 4th July (Bignell). I have examples from Felden (Piffard), Nunton in Wilts (Marshall), Devonport in June (de la Garde), a full series from Shere (Capron), and Shepton Mallet in Somerset early in August (Charbonnier). Chapman has bred it on 24th April from larvae of *Mesophleps Corsicellus* feeding on *Cistus* at Cannes; Bankes has raised both sexes in June, 1902—with *Pimpla ventricosa* and *Phytodictus obscurus* (*cf.* Ichn. Brit. iii. 247)—from larvae of *Laverna conturbatella*, Hb., near Ashford in Kent; and a dozen emerged during the end of May and June, 1896, from *Gelechia Sangiella* near Hesleden Dene, Co. Durham. The cocoon is dull, cylindrical and black with a central white girdle, 5 mm. in length and $1\frac{1}{2}$ mm. in central breadth, the whole covered with fine interwoven white strands, and laterally spun upon the food-plant; the imago emerges through an

irregular hole a little to the side of one apex. I have frequently taken it during May and June by sweeping at Winterton in Norfolk, Bentley Woods, Brandon Staunch, Palmers Heath, etc., in Suffolk.

33. *exareolata*, Ratz.

Campoplex exareolatus, Ratz. Ichn. d. Forst. iii. 89, ♀. *Limneria exareolata*, Holmgr. Sv. Ak. Handl. 1858, p. 96; Brisch. Schr. Nat. Ges. Danz. 1880, p. 172; Bridg.-Fitch, Entom. 1885, p. 104, ♂ ♀. *Angitia exareolata*, Thoms. O.E. xi. 1163, ♂ ♀.

Head posteriorly little constricted, with palpi and mandibles flavidous. Antennae longer than half body, with the scape of ♀ sometimes obsoletely pale, of ♂ stramineous with usually only lateral black lines and flagellum rufescent below. Thorax gibbulous, hardly narrower than head; areola subtransverse, with obsolete costulae. Abdomen subfusiform and slightly compressed apically; postpetiole very little longer than broad and double breadth of petiole; second segment of ♀ not, and of ♂ slightly, longer than broad; terebra stout and a third the abdominal length. Legs clear red, with coxae except the testaceous apices of the anterior black; trochanters flavidous, with hind ones basally black; hind tibiae immaculate, their tarsi only apically infuscate; calcaria elongate, hind claws pectinate to their centre. Stigma and tegulae both bright flavous, former rarely infuscate; areolet wanting. Length, 5-7 mm.

Very like *A. Fitchi* but at once known by the exerted terebra, more nitidulous abdomen, fulvous anterior legs, etc.

Common in northern and central Europe; not infrequent throughout Sweden in May, July and August; France, Belgium, etc.; originally bred in Germany on 19th July, 1850, from a pupa of *Earias chlorana* by Brischke, who describes the cocoon as länglich rund, weiss and subsequently raised it from galls of the Cynipid *Trigonaspiis megaptera*; Gaulle also records it from *Cacoecia rosana*. In Britain it has been bred from *Coccyx ustomaculana* (Trans. Ent. Soc. 1884, p. 430) and *Lithocolletis ulmi-foliella* (Entom. 1884, p. 67). It is recorded from the Lands End district (Marquand), Earlham near Norwich and bred from *Eupithecia assimilata* and *E. pulchellata* (Bridgman), and in south Devon *Vanessa cardui* (Big-nell). I have specimens from Botusfleming (Marshall), a full series from Shere (Capron), Felden (Piffard); captured in Kew Gardens on 23rd September, and bred in July from *Gelechia Mouffetella* at Netley Heath in Surrey (Sich); and bred, with the Braconids *Microgaster tibialis* and *Asco-gaster rufipes*, from Aberdeenshire *Euchromia flammearia* (Rev. C. D. Ash). It is by no means common on the wing and I have only thrice captured it in June and August at Barnby Broad, in Southwold and by beating old oaks at Brandon, just before dusk. It is said (Proc. S. Lond. Ent. Soc. 1896, p. 85) to have been raised in both sexes from larvae of *Cleocoris viminalis*, Fab.

34. *reticulata*, Bridg.

Limneria reticulata, Bridg. Trans. Ent. Soc. 1884, p. 430, ♂ ♀.

A form of both sexes of the last species was found by Bridgman to sometimes bear no punctures upon the mesonotum and mesopleurae, and this was considered by him to constitute a new species under the above name.

A. exareolata has the mesopleurae distinctly and coarsely punctate with the mesonotum both punctate and coarsely reticulate, especially in the ♂; *A. reticulata*, on the contrary, has the mesopleurae bearing hardly visible indications of punctures and the mesonotum simply reticulate with no punctures. Antennae of ♂ unusually elongate. Length, 6 mm.

Both sexes were bred by Fletcher of Worthing from *Tortrix* larvae, found on the flowers of *Cornus* in 1884. I possess a male with impunctate mesonotum, flavous legs and black hind coxae, taken by Mr. E. A. Butler early in August, 1900, at Abinger Hammer in Surrey.

35. *Fitchi*, Bridg.

Limneria Fitchii, Bridg. Trans. Ent. Soc. 1881, p. 157; Bridg.-Fitch, Entom. 1885, p. 104, ♀. *Angitia Fitchi*, Thoms. O.E. xi. 1163, ♀. *Eriborus Fitchi*, Schm. Opusc. Ichn. 1646, ♀.

A black species and very dull, with legs stramineous and areolet wanting. Head with the vertex distinctly narrow; mandibles and palpi whitish. Antennae slender and black, with scape fulvous or stramineous beneath. Thorax very dull and gibbulous; metathorax finely sculptured with carinae fine, areola longer than broad, apically obsoletely complete and widest before its centre, with costulae sub-entire. Abdomen black and in ♀ compressed from the subquadrate third segment; postpetiole subparallel-sided, second segment a fourth longer than broad; terebra reflexed and not extending beyond anus. Legs stramineous, with hind ones of ♀ fulvous; all the trochanters, and apices of anterior coxae whitish; hind, and base of anterior, coxae black; hind tibiae and tarsi flavous, with apices of latter hardly infusate. Stigma luteous, tegulae flavous; areolet wanting. Length, 6 mm. ♀ only.

This and the two preceding species differ from *A. interrupta* in lacking all trace of areolet and in having the hind tibiae unicolorous; from the remainder of this genus in Britain, these three are distinct in their gibbulous thorax, with dull or barely shining speculum, and usually wanting metanotal costulae, in the seventh ♀ segment not being excised and in their elongate hind calcaria, of which the inner is longer than half the metatarsus.

It was bred by Bignell from *Nola albulalis*, evidently not in Devon, since it is not included in his county list, though recorded at Entom. 1881, p. 140. It has not been yet noticed on the Continent and must be very rare with us, for it has not again been mentioned; I am fortunate in possessing two co-types in Dr. Capron's collection together with the larval skins whence they emerged, both through a subcircular hole in the anal dorsum; Bridgman says "this species, contrary to the general habits of this genus [*Limneria*], does not spin a cocoon, but emerges from the long-haired, pale-coloured larva of its host."

36. *combinata*, Holmgr.

Limneria combinata, Holmgr. Sv. Ak. Handl. 1858, p. 62, ♂ ♀. *Angitia combinata*, Thoms. O.E. xi. 1887, p. 1162, ♂ ♀.

A black species with the head but little constricted posteriorly and face narrower than frons; palpi and centre of mandibles flavidous. Metanotum with five complete arcae, of which the areola is rarely apically incomplete.

Abdomen entirely black, with the second segment fully a third longer than broad; postpetiole hardly longer than broad; anus compressed; ventral plica flavous; terebra a little longer than the basal segment. Femora deep red and slender with the posterior always basally black; anterior trochanters flavous; tibiae subtestaceous, with the hind ones obsoletely binotated with black, and their tarsi infusate with base paler. Stigma dull stramineous; areolet subtriangular, shortly petiolate, emitting recurrent nervure beyond its centre. Length, 5-6 mm.

Distinguished from the whole remainder of the genus (except perhaps the next two) by having the apical abscissa of the radial nervure hardly longer than the basal, the apex of the discoidal cell nearly rectangular below, the calcaria of subequal length, the female face narrow and the slender, nearly straight terebra only a third the length of the black abdomen, the seventh female segment of which is excised. The femora vary considerably in colour and are sometimes piceous or nigrescent, but both extremities of the hind ones are usually infusate, and the base always.

It is locally not uncommon in northern and central Europe; France, Belgium; it occurs in Sweden during the latter half of July; but Brischke's Prussian records seem uncertain. It is only known as British from Bignell's Devon record that it was "captured at Bickleigh, 3 May."

37. *variabilis*, Bridg.

Limneria variabilis, Bridg. Trans. Ent. Soc. 1886, p. 352, ♂ ♀.

A somewhat shining, black species. Head transverse, a little broader than thorax, and slightly oblique posteriorly; face punctate, not broader than long, and apically constricted; eyes internally hardly emarginate, apex of clypeus broadly rounded and laterally foveate; centre of mandibles piceous or dull flavous. Antennae of ♂ about five-sixths the length of the body, of ♀ a little shorter. Thorax a third longer than high; mesonotum reticulate, with fine and sparse punctures; metathorax nitidulous and finely reticulate with areola pentagonal, longer than broad, apically incomplete and laterally subparallel-sided; costulae not very evident; mesopleurae dull and finely reticulate with fine and sparse punctures, speculum glittering. Abdomen immaculate black; of ♂ subcylindrical and of ♀ fusiform, with the segments closely and finely white-pubescent, their apical margins smooth and shining; basal segment as long as hind coxae and trochanters, with petiole somewhat stout, slightly longer than and about half the breadth of the laterally somewhat rounded postpetiole; second segment of ♀ slightly longer than broad, of ♂ a third longer, with distinct gastrocoeli; third segment the broadest, of ♀ transverse, of ♂ subquadrate; terebra not quite half length of abdomen. Legs normal and variably red; coxae and posterior trochanters black; hind tarsi, their femora nearly entirely and the intermediate basally nigrescent; posterior tibiae infusate-piceous at apices and before base; hind tarsi with joints often basally pale, their onyches finely punctate basally. Stigma more or less deeply infusate, tegulae flavous or pale piceous; areolet broad, petiolate or sessile, emitting recurrent nervure beyond its centre; nervellus subgeniculate, emitting no spurious nervure. Length, circa 4 mm.

Bridgman considered that "This comes very near to *Limneria combinata*, Holmg., but has the stigma of a different colour."

The typical specimens of both sexes were bred by Fletcher during June, 1886, from *Gelechia notatella* at Wicken in Cambridgeshire.

38. *tripunctata*, Bridg.

Limneria tripunctata, Bridg. Trans. Ent. Soc. 1886, p. 351, ♀.

Black with the head transverse and posteriorly suboblique; face transverse and mandibular teeth of subequal length; palpi and mandibles rufescent flavous, with the latter infuscate at both extremities. Antennae a little longer than half body, with scape immaculate. Thorax somewhat dull; metanotal areola as long as broad, parallel-sided with costulae obsolete and petiolar area not concave; mesopleurae somewhat dull with very fine trans-striation. Abdomen immaculate black, as broad as thorax and a little longer than head and thorax; basal segment normal, with postpetiole about as long as and two-thirds broader than petiole, laterally rounded, with three distinct foveae at its base; second segment quadrate; remainder transverse and laterally pubescent, broadest at apex of the fourth segment; terebra a little longer than basal segment or about a third of the abdominal length. Legs red; coxae and trochanters black, with extreme apices of the latter rufescent; extreme apices of hind tibiae nigrescent, with their base (? or base of their dark apices) rufescent; intermediate tarsi apically infuscate. Stigma stramineous, tegulae flavidous-white; areolet petiolate, apical radial abscissa slightly curved, nervellus entire. Length, 5 mm. ♀ only.

"The three pits in the postpetiole readily distinguish this from any other *Limneria* I am acquainted with, although the same character is found in two other insects belonging to the allied genera of *Casinaria* and *Sagaritis*, viz., *C. senicula*, Gr., and *S. incisa*, m.," says Bridgman. From the description alone it appears most closely allied to *Angitia combinata*, but this position must be regarded as tentative.

This female was captured at Peckham during May, and no one has hitherto reviewed it.

ANILASTA, Thomson.

Thoms. O.E. xi. 1887, 1168.

Body more or less distinctly stout, never very small nor with the face silvery-pilose. Head transverse, anteriorly triangular, with the vertex not broad; cheeks somewhat elongate and not buccate, with the costa inflexed; clypeus convex, apically rounded and margined with small lateral foveae; mandibles narrow towards their apices and usually together with the palpi pale, with teeth of equal length; peristomium small, eyes internally emarginate. Antennal flagellum generally elongate and stout, becoming apically attenuate; scape not very often pale beneath. Thorax stout, higher than broad, not cylindrical; mesosternum nearly always transverse; metanotal carinae usually strong, with the areola very frequently transverse and angulated. Abdomen very often centrally more or less broadly red or castaneous; petiole with lateral sulci distinct and evidently narrower than postpetiole, which is subquadrate with its sides not rounded and lateral scrobes distinct; second segment not or hardly longer than the third and not transverse; seventh rarely incised in ♀; terebra sometimes extending beyond anus but rarely as long as or longer than basal segment, with valvulae apically dilated and pilose. Legs and their unguiculi not stout, with tibiae often externally spinulose; claws pectinate. Wings with the stigma somewhat narrow; areolet usually

irregular, small and petiolate, or wanting; radial cell sublanccolate and apex of the discoidal acute below; anal nervure emitted from centre of brachial cell and the cubital not often divergent; nervellus neither oblique nor geniculate.

This genus is said to differ from *Angitia* mainly in the larger and stouter body, the capital conformation, internally emarginate eyes, more oblique basal nervure, the relative length of the second and third segments and in the short, apically explanate terebra.

Table of Species.

(2).	1. Front wings with the areolet entirely wanting	1. BRACCATA, <i>Gmel.</i>
(1).	2. Front wings with the areolet evidently entire.	
(10).	3. Antennae stout and hardly extending beyond thorax.	
(7).	4. Centre of abdomen broadly castaneous or rufescent.	
(6).	5. Tibiae dull stramineous; terebra length of first segment	2. RAPAX, <i>Grav.</i>
(5).	6. Tibiae red, subimmaculate; terebra hardly length of postpetiole	3. NOTATA, <i>Grav.</i>
(4).	7. Abdomen black, with at most third segment laterally piceous.	
(9).	8. Front trochanters black; terebra length of postpetiole	4. EBENINA, <i>Grav.</i>
(8).	9. Front trochanters red; terebra hardly extending beyond anus	5. CARBONARIA, <i>Ratz.</i>
(3).	10. Antennae more slender and extending distinctly beyond thorax.	
(22).	11. Abdomen more or less extensively red; terebra often exerted.	
(21).	12. Ventral plica piceous or nigrescent; scape usually black.	
(18).	13. Central segments alone rufescent; anus black.	
(17).	14. Tegulae stramineous; speculum usually nitidulous.	
(16).	15. Scape black; mesopleurae shining; terebra subexserted	6. RUFICINCTA, <i>Grav.</i>
(15).	16. Scape pale below; mesopleurae dull; terebra long as postpetiole	7. BARRETTI, <i>Bridg.</i>
(14).	17. Tegulae black; speculum distinctly dull	8. DOLOSA, <i>Grav.</i>
(13).	18. Central segments and sides of whole anus rufescent.	
(20).	19. Mandibles white; hind tibiae basally black; terebra hardly exerted	9. CAEDATOR, <i>Grav.</i>
(19).	20. Mandibles black; hind tibiae basally white; terebra length of first segment	10. RUFA, <i>Bridg.</i>
(12).	21. Ventral plica and underside of scape flavidous	11. TRICINCTA, <i>Holmgr.</i>
(11).	22. Abdomen nearly entirely black; terebra not or hardly exerted.	
(26).	23. Ventral plica flavidous.	
(25).	24. All the femora and tibiae entirely rufescent	12. CLAUSA, <i>Brisch.</i>

- (24). 25. Hind femora, and two tibial marks,
black 13. *INQUINATA*, *Holmgr.*
(23). 26. Ventral plica nigrescent.
(28). 27. Coxae red; hind tibiae centrally white 14. *COXALIS*, *Brisch.*
(27). 28. Coxae black; hind tibiae not centrally
clear white.
(30). 29. Areola deeply impressed, with strong
costulae 15. *PLACTIDA*, *Desv.*
(29). 30. Areola not or hardly impressed, with
no costulae 16. *BRISCHKEI*, *Bridg.*

1. *braccata*, *Gmel.*

Ichneumon braccatus, Gmel. S.N. 1790, 2705. *Campoplex braccatus*, Gr. I.E. iii. 549. *Linnaeria braccata*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 172; Bridg.-Fitch, Entom. 1885, p. 105, ♂ ♀. *Anilasta braccata*, Thoms. O.E. xi. 1175, ♂ ♀.

A black species with the face and metathorax somewhat closely white-pubescent, and anus broadly red. Head with the palpi and mandibles flavidous; antennal scape pale stramineous beneath; metathoracic areola pentagonal, with distinct costulae. Abdomen castaneous or dull red with the two basal segments, and base of the third discally, black; basal segment longer than hind coxae and trochanters, the second longer than broad; terebra shortly exerted. Legs pale fulvous, with coxae black and trochanters stramineous; front coxae apically pale, hind trochanters basally rufescent above; hind femora and tibiae nigrescent with apices of the former, and centre of latter externally, rufescent. Wings slightly clouded; areolet wanting, stigma infusate, tegulae pale stramineous, fenestrae punctiform, radial nervure apically elongate, nervellus not geniculate. Length, 7 mm.

Nees took one about Sickershausen. Brischke bred both sexes in Prussia from *Hypna rostralis*, gives a good description and adds that the cocoon is cylindrical, brownish-grey with a yellowish central zone; he doubtfully referred it to Förster's genus *Eriborus*, which differs from the present only in its lack of areolet, and there it is treated of by Schmiedeknecht, who has found a few specimens in Thuringia. It is given as British, under *Linnaeria*, in Marshall's 1870 Catalogus; but I cannot find that anyone has actually taken it, nor upon what grounds Marshall included it. The only subsequent records are Thomson's from Dalmatia, Gaulle's from France and Tosquinet's in August from Belgium. Mr. van Burgst has given me this species from Breda.

2. *rapax*, *Grav.*

Campoplex rapax, Gr. I.E. iii. 568, ♂ ♀; Holmgr. Sv. Ak. Handl. 1854, p. 17, ♂. *Linnaeria brevicornis*, Holmgr. *lib. cit.* 1855, p. 66, ♀. *L. rapax*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 163, ♂; Bridg.-Fitch, Entom. 1885, p. 206, ♂ ♀. *Anilasta rapax*, Thoms. O.E. xi. 1169, ♂ ♀.

A black species with the abdomen centrally castaneous, the femora red and tibiae dull stramineous with the hind ones bi-infusate; terebra as long as the basal segment, mandibles black, tegulae white and mesopleurae closely and alutaceously punctate; stigma pale and fenestra large. Length, 7-8 mm.

This and the two following species differ from the remainder of the genus in having the vertex less constricted posteriorly, the lower margin of the mandibles basally reflexed, the antennae stout and short, not or hardly extending beyond the thorax, with the scape entirely black; the areolet small and petiolate, the ventral plica nigrescent or dark red and the femora entirely clear red.

I should have suspected this species to have been erroneously given as British by our older authors were it not that Bignell says of it (Trans. Devon. Assoc. 1898, p. 492) "Captured at Bickleigh, 20 August." On the Continent it is everywhere rare; Gravenhorst knew it from Silesia and Hanover, but it is doubtful if the species recorded thence by Ratzeburg (Ichn. d. Forst. i. 98) under this name from *Bombyx Monacha* be synonymous; it was found by Boheman very rarely in Sweden and by Thomson, who records it from Switzerland, on Oland Isle; and Gaulle gives it as French.

3. *notata*, Grav.

Campoplex notatus, Gr. I.E. iii. 570, ♂ ♀, excl. var. 1. *Limneria notata*, Holmgr. Sv. Ak. Handl. 1858, p. 78; Brisch. Schr. Nat. Ges. Danz. 1880, p. 164; Bridg.-Fitch, Entom. 1885, p. 206-7; Kreich. Progr. Gymn. Pola, 1894, p. 19. *Amilasta notata*, Thoms. O.E. xi. 1169, ♂ ♀.

Black with the abdomen broadly dark red in the centre, the femora and tibiae red, and the hind tibiae centrally but little paler and usually subinfusate at apex and before base; terebra not longer than half basal segment; stigma pale and fenestra large. Length, 6-7 mm.

Like the last species in its black mouth with only palpi pale, the white tegulae, subcompressed cheeks and slightly elevated genal costa, but distinct in the red hind tibiae of both sexes and distinctly shorter terebra.

Austria, Italy, Germany and France, Belgium in July and not common in Sweden at the end of the same month, where Holmgren once took a pair *in cop.*; Brischke says he bred it from a Prussian *Noctuid* pupa, and Giraud (Ann. Soc. Fr. 1877, p. 404) raised it from *Cucullia verbasci* and *Eriopus pteridis*. With us, the form with immaculate red tibiae was found by Hope about Netley in Shropshire; it is given, with a query respecting the identity, from the Isle of Man (Entom. 1872, p. 432); Bridgman found it at Harford Bridges, Norwich, in July, and Bignell says he bred it from *Gnophos obscurata* in Devon on 9th June. I am not quite satisfied with the last record, unless forced, for it has rarely occurred before the end of that month, when I twice met with it in 1907 at Ventnor and at 450 feet on Arretton Down in the Isle of Wight, as well as at Rockland Broad in Norfolk; in both July and August, Adams has captured the female in Lyndhurst; in August I have swept it in Matley Bog and Lyndhurst, and at Dodington in Kent, while towards its close Butler took it at Abinger Hammer in Surrey, where Capron secured a full series. Were it not for Bridgman's record above, and a female from Tuddenham Fen. I should consider it confined to south of the Thames, and a female, labelled "Ipswich, 1894," to be wrongly localised. At Ashford in Kent Mr. H. Wood bred a female hyperparasitically, through a *Tachinid* fly, from *Lycæna agestis* during July, 1908; it spun no cocoon at all of its own, but emerged through an irregular hole near one extremity of the dipteran's puparium. I also have a female bred by Barrett from *Anarta myrtilli*.

4. *ebenina*, Grav.

Campoplex ebeninus, Gr. I.E. iii. 480; *C. melanarius*, Holmgr. Sv. Ak. Handl. 1858, p. 37; Bridg.-Fitch, Entom. 1885, p. 15, ♂ ♀. *Limneria ebenina*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 153, ♀. *Anilasta ebenina*, Thoms. O.E. xi. 1170, ♂ ♀.

Black with the somewhat densely pubescent abdomen entirely concolorous, the seventh segment excised and terebra almost shorter than the postpetiole; all the femora and tibiae red, coxae and trochanters black; recurrent nervure emitted from near centre of the areolet; stigma pale and fenestra large. Length, 6–7 mm.

Differs from all our other species with large fenestrae and margined mandibles in its black abdomen and anterior trochanters.

Not very common, though widely distributed, in northern and central Europe. It has been bred by Brischke from a *Noctuid* pupa, by Mocsary from *Orgyia cricae*, by Bridg.-Fitch (Entom. 1885, p. 19) from *O. fascelina* by Harwood, who writes to me "I once found this moth in some numbers at Colchester and bred a good many specimens of *C. ebeninus* from them," and Bignell (*lib. cit.* 1883, p. 66) raised it from the same host. But there are no other records of capture and it is certainly uncommon with us. Bradley has found it about Birmingham; Capron took half-a-dozen, including both sexes, in Surrey; Miss Chawner has given me a New Forest male; and Garde captured it at Chatham in May, 1892. Keys bred a female from its irregularly black-bicingulated dull white cocoon, the outer covering of which is formed by the indurated skin of the defunct host-larva whose pale head is always attached to exactly one extremity; this was found on *Rhamnus Frangula* on the banks of the Dart, near Ashburton, on 8th July, 1903; Gaulle gives *Pieris* and *Gonepteryx* as generic hosts, so the above may have emerged from *G. rhamni*. In the British Museum is a female of this parasite together with the indurated larval skin of *Chrysophanus dispar*, from which Stephens had bred it in the Cambridgeshire Fens many years ago.

5. *carbonaria*, Ratz.

Campoplex carbonarius, Ratz. Ichn. d. Forst. i. 93, ♂ ♀; ii. 82; iii. 83; Brisch. Schr. Nat. Ges. Danz. 1880, p. 144, ♀. *Anilasta carbonaria*, Thoms. O.E. xi. 1170, ♀.

Black with the abdomen entirely concolorous, and the terebra hardly extending beyond the anus; all the femora and tibiae red, trochanters except basal joint of the hind ones concolorous; recurrent nervure almost continuous with external nervure of areolet; stigma pale and fenestra large. Length, 6 mm.

The distinction from the last species is not very pronounced and the records seem much intermingled. The pale trochanters, shorter terebra and, Schm. adds, position of recurrent nervure are distinct.

Ratzeburg describes the larva and pupa of a female he bred in the Hartz Mountains from *Orgyia antiqua*, adds that Graff, Bouché and Nordlinger raised it also from *O. fascelina*, the first from *Tortrix picana* (*xylostana*), and that a probably synonymous male emerged from *Lophyrus pini*; later Brischke bred it from *O. gonostigma* in Prussia. Elsewhere it

is only known from Palsjo in Sweden. But Schmiedeknecht rejects the above hosts and quotes only the three following, which seem far from satisfactory to me, for Bridgman in introducing the species as British (Trans. Ent. Soc. 1881, p. 100) shows considerable hesitation: "I have taken a *Limneria* in this neighbourhood, which agrees better with this insect than any other I can find described; the only difference is that Brischke says 'the disco-cubital nervure angled, with a short nervelet'; in my specimens, although the nervure is angled, yet the nervelet is absent. I have also seen the same insect bred by Mr. Bignell from *Cidaria pyraliata*." His neighbourhood is that of Norwich, yet this species is omitted from his 1894 local list altogether, which argues mis-identity, and Bignell in 1898, so far from citing the above host, simply tells us that he bred it in the middle of June from *Boarmia roboraria* and early in July from *Amphydasis prodomaria* in Devonshire. *Taeniocampa populeti* had earlier (Entom. 1885, p. 19) been added to its hosts.

6. *ruficincta*, Grav.

Campoplex ruficinctus, Gr. I.E. iii. 580, ♂ ♀. *Limneria ruficincta*, Holmgr. Sv. Ak. Handl. 1858, p. 79; Brisch. Schr. Nat. Danz. 1880, p. 164; Bridg.-Fitch, Entom. 1885, p. 207, ♂ ♀. *Anilasta rufocincta*, Thoms. O.E. xi. 1170, ♂ ♀.

Not very stout and black with the second and third segments usually nearly entirely, sometimes also part of the first and fourth red, terebra extremely shortly exserted; femora red, tibiae flavidous with the hind ones white, their apices nigrescent and a band before their base more or less piceous red; basal half of hind metatarsus also white, as are their calcaria; trochanters red, or in ♂ stramineous, with only basal joint of the hind ones black; mesopleurae very finely alutaceous, with subnitidulous speculum; radial nervure apically elongate; tegulae white; scape and ventral plica not pale. Length, 5-7 mm.

This and the next species are known by their distinctly red-marked abdomen, dark ventral plica, elongate antennae, narrow capital vertex and short fenestra, which does not reach centre of recurrent nervure.

A common species throughout probably the whole of Europe in July and August, often on umbelliferous flowers; it is said by Brischke to have been raised from pupae of *Earias clorana*, *Noctua* sp., *Dianthaccia Echii*, *Hadena porphyrea* and *Cucullia tanacetii*. It is twice recorded from *Anarta myrtilli*, both larvae and pupae (Proc. S. Lond. Ent. Soc. 1896, pp. 83, 86); from larvae of both *Heliothis dipsacea* and *Dianthaccia irregularis* at Tuddenham early in August (E.M.M. 1907, p. 86; cf. Entom. 1881, p. 140); and by both Barrett and Fletcher from *Pterophorus plagiodyctylus* (Entom. 1883, p. 66). It is sufficiently common with us: Brundall, Earham and Aylsham in Norfolk (Bridgman) and Bignell's capital list of Devon hosts is: on 20th April from *Agrotis agathina*, on 5th July from *Heliophobus popularis*, on 8th from *Pterophorus leucii* and *Ellopiia fasciaria*, on 10th from *Cucullia verbasci*, on 3rd August from *Dianthaccia cucubali*, on 13th from *Cucullia gnaphalii*, on 25th August and 13th September from *Hecatera serena*, and on 28th September from *Anarta myrtilli*. Capron bred it in Surrey from its brownish white and subcylindrical cocoon of 6 × 3 mm. with an irregular and sometimes faint black circle midway between the centre and apices, which appears to have been spun within the skin of

the defunct host-larva. Abinger Hammer in August, 1900 (Butler), Nunton in Wilts (Marshall), Deal in 1907 (Donisthorpe), Felden in June (Piffard), Greenings in July (Saunders), and on *Heracleum sphondylium* flowers in the middle of July, 1899, at Barham Oak Wood (Sparke); I have not often met with it at Calbourne in the Isle of Wight and in Suffolk on *Angelica sylvestris* in Finborough Park.

7. *Barretti*, Bridg.

Limneria Barrettii, Bridg. Trans. Ent. Soc. 1881, p. 158, pl. viii, fig. 14; Bridg.-Fitch, Entom. 1885, p. 205, ♂ ♀. *L. (Anilasta) tuecarii*, Bridg. Trans. Ent. Soc. 1889, p. 429, ♂ ♀. *Anilasta Barretti*, Thoms. O.E. xi. 1171, ♂ ♀.

Black with the second and third segments of the dull and pubescent abdomen only laterally red, terebra as long as postpetiole, and seventh ♀ segment incised; femora fulvous; anterior trochanters and hind trochanterellus and their tibiae white, hind tibiae apically black; mesopleurae with the speculum dull; tegulae and underside of scape white, ventral plica not pale. Length, 5–6 mm.

Differs from the last in its more sparsely red-marked abdomen, pale scape and dull speculum.

Both sexes were originally bred by the late Mr. C. G. Barrett from *Oxyptilus teucarii* in Britain, and Thomson found the species rarely at Ilstorp in Sweden. I possess co-types (and have examined the type at Norwich) of both sexes of *L. teucarii* in Dr. Capron's collection and, since I can detect no distinction from the present species, I am led to synonymise that name, the types of which were raised by Bignell in Devon and Fletcher also from *Pterophorus teucarii*; "its transformation takes place in the inflated skin of that larva, or it makes but a very slight transparent cocoon within it." Its author subsequently captured it at Earlham in July and August; Wainwright has sent it me from West Runton in Norfolk in August; I have both sexes, bred from the above host-larva when in its penultimate skin by Chapman at Reigate on 3rd and 10th July, 1899; and on 17th July, 1902, "from the pupa" of a larva of this species, taken at Kinner Edge on the 5th of the preceding month by Carleton Rea of Worcester.

8. *dolosa*, Grav.

Campoplex dolosus, Gr. I.E. iii. 573, ♂ ♀. *Limneria dolosa*, Holmgr. Sv. Ak. Handl. 1858, p. 46; Brisch. Schr. Nat. Ges. Danz. 1880, p. 164; 1892, p. 45; Bridg.-Fitch, Entom. 1885, p. 207, ♂ ♀. *Anilasta dolosa*, Thoms. O.E. xi. 1172, ♂ ♀.

Black with the centre of the abdomen broadly, femora and tibiae red, the hind tibiae basally and apically with their tarsi black; terebra hardly extending beyond the anus, second segment subquadrate; tegulae, at least in ♀, black; mesopleural speculum dull; ventral plica and scape not pale. Length, 6–7 mm.

Our only species with black tegulae and centrally red abdomen. Holmgren considered it very like *A. notata*, but more slender with the abdominal and metathoracic sculpture different.

Widely distributed but not common on the Continent in July and August, and said by Gaulle to have been raised from *Larentia luctuata*.

Marshall's 1870 Catalogus contains this species, but the only record with us is Bridgman's, who says in 1894 that it is not uncommon in Norfolk at Brundall and Heigham in July and October, adding that it has been bred from *Lasiocampa quercifolia* by Laddiman. I have but a single female, taken by the Rev. T. A. Marshall at Cornworthy in Devon.

9. caedator, Grav.

Campoplex caedator, Gr. I.E. iii. 561, ♀. *Limneria caedator*, Woldst. Bull. Acad. Petersb. 1876, p. 393; Bridg.-Fitch, Entom. 1885, p. 207, ♀. *Anilastus caedator*, Schm. Opusc. Ichn. 1801, ♀.

Black with centre of abdomen, sides of anus and the legs fulvous; hind coxae, base of their trochanters, posterior tibiae apically and before the base, black; terebra hardly exerted; mandibles, tegulae and ventral plica white; mandibles small and not reflexed below. Length, 5-6 mm. ♀ only.

Closely allied to *A. inquinata*, but with the femora and sides of anus red.

This species appears to have been much overlooked, because it was not mentioned by either Holmgren or Thomson; it is only recorded abroad from Germany, where Schm. finds it commonly only in some seasons, and France. There are no British records, though it has been long known as indigenous. It is not very frequent with us; but I have a dozen specimens, taken by Piffard at Felden, Saunders at Greenings, Butler near Dorking; and I have swept it, usually in marshes, at Bramford on 3rd May, Tuddenham Fen in June and Bentley Woods in July. On 3rd September, 1910, a male was taken on the flower of evening primrose in Southwold; and early in June Clutton bred a female from *Hypsiopes impluviata* at Burnley.

10. rufa, Bridg.

Limneria rufa, Bridg. Trans. Ent. Soc. 1882, p. 152, ♂ ♀; Bridg.-Fitch, Entom. 1885, p. 206, ♂.

Head transverse and constricted behind the eyes, with palpi flavous; eyes deeply emarginate next the scrobes; frons neither sulcate nor carinate. Antennae a little more than two-thirds as long as the body, immaculate black. Thorax somewhat coarsely punctate, slightly longer than high, with obsolete notauli; sternaui laterally carinate; mesopleurae sparsely punctate, with interstices reticulate; areola distinct, transverse and apically incomplete; costulae often entire; petiolar area not concave, subdeplanate; spiracles oval. Scutellum only basally carinate. Abdomen red; petiole piceous, with its sides and the second segment subinfusate; postpetiole slightly shorter and double breadth of petiole, a little longer than broad; anus hardly compressed and terebra shortly exerted; basal half of venter infusate. Legs red with the coxae, trochanters, tarsi except base of front ones, and more or less of hind tibiae infusate; extreme base of all the tibiae white-dotted above, the hind ones centrally subrufescent. Stigma and nervures black, tegulae white; arcelet shortly petiolate, emitting recurrent nervure immediately beyond its centre; nervellus not geniculate. Length, 9 mm.

Bridg.-Fitch differentiate this species from the rest of the broad genus *Limneria* by the characters:—Abdomen red with petiole alone black; scape immaculate beneath; hind femora red; tibiae rufescent and not infuscate towards their base; front and hind coxae black; terebra about as long as basal segment, not very short.

It was originally bred by Bignell from living larvae of *Bombyx quercus*; and the cocoon is described as oval, black, and granulated on the outside. In his "Note on *Limneria rufa*, Bridg." (Entom. 1883, p. 69), Bignell says that to breed *L. rufa* "it is necessary to obtain the larvae of *Bombyx quercus* this month (March); for this reason, the ichneumon larva leaves its victim before it moults for the fourth time. When it does leave it, it forms an oval, black, rough cocoon under the unfortunate caterpillar on the inside of which it had been feeding. The writer obtained the first infested larva when at Torquay on 14th March, and bred the parasite on 5th April, 1882." The only specimen I can ascribe with any degree of certainty to this species is a male of but 8 mm., which agrees with the description in every way except that the tibiae are not white-marked; it was bred from an unknown host on 21st May, 1902, by Cross in the New Forest; the cocoon from which it emerged is black, but with a white central girdle.

11. *tricincta*, Holmgr.

Limneria tricincta, Holmgr. Sv. Ak. Handl. 1858, p. 80, ♀ (*nec* Grav.); Brisch. Schr. Nat. Ges. Danz. 1880, p. 165, ♂; Bridg.-Fitch, Entom. 1885, p. 205, ♂ ♀. *Anilasta leucomera*, Thoms. O.E. xi. 1172, ♀.

Black with the abdomen more or less narrowly red in the centre and terebra very slightly exserted; femora fulvous; coxae and trochanters whitish, with only the hind coxae black to beyond their centre; tibiae and tarsi flavidous, hind ones stramineous with the former apically and obsoletely before their base, and apices of the tarsal joints, infuscate; antennae pilose; metathoracic carinae subobsolete; areolet oblique and apex of discoidal cell strongly acute below; ventral plica whitish; scape and pedicellus testaceous beneath. Length, 5–6 mm.

The very pale ventral plica, coxae and underside of antennal base are distinctive.

I retain Holmgren's name for this species, since Thomson thought Gravenhorst's male distinct; but if, as he supposes, it be referable to *Olesicampe*, no reason stands for a new name in the present genus.

A female was first taken at Tarna in southern Lapland on 28th July by Boheman and at Yddinge in Sweden by Thomson; in France by Gaulle and twice during August in Belgium by Tosquinet; Chapman has sent me a male he has bred from *Pumea* sp. at Locarna in April, 1900, differing in no particular from the female; but Brischke's Königsberg male with pale orbits seems very different. This species is very uncommon with us; Bridgman introduced a female with entirely red third segment (Trans. Ent. Soc. 1881, p. 160), bred by Barrett from British *Elbulea stachydalis*, but neither he nor Bignell captured it. I possess two pairs, bred by Bignell in Devon on 18th August, 1884, from *Gracillaria syringella*; captured on 29th July, 1900, at Tostock by Tuck; at Much Markle in Hereford by Yerbury at the end of May, 1902; and swept by myself on 22nd August in Tuddenham Fen.

12. *clausa*, *Brisch.*

Limneria clausa, Brisch. Schr. Nat. Ges. Danz. 1880, p. 154, ♀; Bridg. Trans. Ent. Soc. 1881, p. 161, ♂. *Anilastus clausus*, Schm. Opusc. Ichn. 1809, ♀.

Black with the legs fulvous, only coxae and hind trochanters black, hind tarsi piceous; anterior trochanters flavous and calcaria white; scape beneath, radix and tegulae flavescent; petiolar area broad. Length, 6 mm.

This species differs from *A. inquinata* in the immaculate black abdomen, red hind femora and tibiae.

Described from the neighbourhood of Danzig and not hitherto found elsewhere on the Continent. Bignell bred both sexes of this species on 22nd June in Devonshire from *Hybernia defoliaria*, and Bridgman tells us (*loc. cit.*) that the male differs only in having the hind tibiae dark red-brown, paler in the middle.

13. *inquinata*, *Holmgr.*

Limneria inquinata, Holmgr. Sv. Ak. Handl. 1858, p. 75; Bridg.-Fitch, Entom. 1885, p. 107, ♀; (?) Brisch. Schr. Nat. Ges. Danz. 1880, p. 164, ♂. *Anilasta inquinata*, Thoms. O.E. xi. 1173, ♀.

Black with the legs fulvous and basally whitish, the hind ones black with the trochanters whitish and tibiae centrally obscurely rufescent; antennal scape and pedicellus testaceous beneath; petiolar area narrow. Length, 6 mm.

At once known by the black hind femora, red abdominal incisures and centrally hardly pale hind tibiae, and whitish ventral plica. Brischke's tentative male with red femora, red-marked hind coxae and centrally white hind tibiae, must surely be distinct.

I possess three examples taken at Cornworthy by Rev. T. A. Marshall, one I swept at Lakenheath in Suffolk from a hedge-bottom in the middle of June, 1899, and another on flowers of *Heracleum sphondylium* in the middle of July at Oxshott in Surrey. Abroad it has been recorded rarely in Sweden, Germany and France; but there are no records since its introduction as British in 1870.

14. *coxalis*, *Brisch.*

Limneria coxalis, Brisch. Schr. Nat. Ges. Danz. 1880, p. 151; Bridg.-Fitch, Entom. 1885, p. 107, ♂ ♀. *Anilastus coxalis*, Schm. Opusc. Ichn. 1814, ♂ ♀.

Black with the abdomen and scape immaculate, callosity before the tegulae and the legs stramineous; only the hind tarsi, trochanters, with base and apex of tibiae, nigrescent. Length, 7-8 mm.

Remarkable for its entirely pale hind coxae, in which it agrees only with *A. coxator*, Thoms., though differing therefrom in its larger and stouter structure, immaculate scape, rufescent anterior coxae, centrally pure white hind tibiae and longer terebra, which is no shorter than the basal segment.

It was originally bred from *Tortrix* larvae at Danzig; next discovered about Colchester by Harwood; a male was bred from Lepidopterous larvae, taken about Lynn in Norfolk by Atmore (Trans. Ent. Soc. 1886,

p. 114); and doubtfully from *Eupithecia rectangulata* by Bignell (Entom. 1881, p. 140); but the latter occurrence is ignored by Bridgman in 1894 and not mentioned in Bignell's 1898 Devon list. More recently the species had been several times met with by Schm. in Thuringia.*

15. *placida*, Desv.

Campoplex placidus, Desv. Cat. 1856, 97, ♂ ♀. *Limneria vulgaris*, Tschek, Verh. z.-b. Ges. 1871, p. 61; Bridg.-Fitch, Entom. 1885, p. 106, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 150, ♀. *Anilastus vulgaris*, Schm. Opusc. Ichn. 1815, ♂ ♀.

Black with the abdomen immaculate and, in ♀, subfusiform; second segment and the laterally somewhat rounded postpetiole longer than broad, terebra little shorter than basal segment; legs fulvidous with all coxae and base of hind trochanters black; hind tibiae only apically, and their tarsi except basally, piceous. Length, 6–7 mm.

Schm. synonymises *Limneria carbonaria*, Brisch. ♀ (*nec* Ratz.), with *L. vulgaris*; but Brischke knew Ratzeburg's species as well as anyone, and also describes the ♀ of Tschek's insect in the same paper.

Austria, Prussia and France. Tschek's species was introduced as new to our fauna by Bridgman (Trans. Ent. Soc. 1881, p. 161) on the strength of a female taken, probably at Bickleigh, by Bignell who subsequently bred it from *Gonepteryx rhamni* (Entom. 1883, p. 66), on 4th July in Devon, and states in 1898 that "more than one-half of the larvae of this butterfly are destroyed by this parasite," adding (E.M.M. 1896, p. 212) from one of these parasitic cocoons "*Hemiteles areator* emerged on July 23rd. I have several times bred *H. areator*, but could not say for certain that it was a hyperparasite in any of the cases" (*cf.* Ichn. Brit. ii. 133). I have the species in Capron's Surrey collection.

16. *Brischkei*, Bridg.

Limneria Brischkei, Bridg. Trans. Ent. Soc. 1882, p. 153; Bridg.-Fitch, Entom. 1885, p. 106, ♀. *Anilastus Brischkei*, Schm. Opusc. Ichn. 1816, ♀.

Black with the abdomen immaculate, and both petiole and postpetiole slender and elongate; legs fulvous with coxae and base of hind trochanters black, trochanters with apices of anterior coxae flavous; hind tarsi except basally, and usually both extremities of their tibiae, subinfuscate; ♂ valvulae as long as ♀ terebra and hardly shorter than postpetiole. Length, 6 mm. ♂ ♀.

Remarkable for the slender and elongate basal segment and legs.

"*Limneria Brischkei* is a new species, bred last year. The parasitic larva came out of a small larva (about one-third grown) of *Noctua triangulum*, which was obtained during the first week in March at Penzance. After leaving its victim it formed a long, dirty white, rough cocoon, without zones; the empty skin of the *Noctua* larva remained attached to its side; the imago appeared on the 5th April" (Bignell, Entom. 1883, p. 69). Bridgman considered it a common species in Norfolk and I have

* *Limneria Prussica*, Brischke (1880, transposed to the present genus by Schmiedeknecht, closely allied to *Anilasta coxalis*) has been simply indicated as British with a note of interrogation by Bridg.-Fitch (Entom. 1885, p. 106) and requires confirmation. It differs from the above species in its black hind coxae and from the two next in its basally pure white hind tibiae.

a full series from the neighbourhood of Shere; but it is not yet known to occur on the Continent. Piffard took both sexes with some frequency about Felden; I have met with the species about Stonehenge in Wilts towards the end of June and beaten it from birch in Tuddenham Fen, Suffolk, at the end of August.

HOLOCREMNA. Thomson.

Thoms. O.E. xi. 1887, 1176.

Head with the vertex nearly entire behind the hardly emarginate eyes, not or but little constricted; cheeks buccate and not short with costa inflexed, more rarely sinuately continuous, and not short; clypeus apically broadly rounded, subtruncate, margined, with small lateral foveae; mandibles somewhat stout and short, with teeth of equal length and peristomium somewhat large. Antennal scape generally pale beneath; flagellum attenuate and somewhat elongate. Thorax gibbulous and not laterally compressed; pronotum very rarely laterally striolate and epomiaee usually wanting; metathoracic carinae stout, but the costulae generally wanting; areola often short, always laterally but not apically entire. Abdomen with the first segment with lateral petiolar sulci distinct and postpetiole very strongly broader than petiole, not or hardly longer than apically broad, usually laterally punctate, with spiracles at an appreciable distance from the lateral scrobes; second segment subquadrate, with somewhat distinct thyridii and not or hardly longer than broad; apical segment laterally and the venter usually pale; terebra not or hardly extending beyond the anus. Legs somewhat stout with the tibiae hardly spinulose, the claws pectinate and unguiculi not stout. Wings with the stigma narrow and very often dark; areolet somewhat broad, irregular and shortly petiolate, emitting the recurrent nervure with its small or punctiform fenestra beyond the centre; apex of discoidal cell acute below; radial cell not broad with apical abscissa of radius usually straight and much longer than the curved basal; cubital nervure generally parallel with the basal; nervellus neither oblique nor geniculate.

Schmiedeknecht, following Thomson, remarks that this genus "is the most difficult to recognise of all the subgenera of the old genus *Limneria*. It is most like *Olesicampa*, but here the species are as a rule smaller, the head is shorter behind the eyes and not cubical, the clypeus apically rounded and the mandibular teeth of equal length; the stigma is usually dark and the second segment is rarely distinctly longer than broad; also in the present genus the abdomen is usually only laterally red. From *Anilasta* it is best distinguished by the shape of the head and the buccate cheeks; from *Angitia*, with which only the males can be confused (since the terebra is always short), the shape of the head and the colour of the abdomen furnish distinctions. I will not omit to emphasise that it requires a skilled eye to detect these differences." It is said by Thomson to attack larvae of Tenthredinidae.

I have omitted *H. canaliculata* from our fauna, since the short diagnosis, given by Bridgman (Trans. Ent. Soc. 1882, p. 151) in introducing it, disagrees in almost every particular, and especially the second segmental length and lacking costulae, from the description of authors; this was raised from Lepidopterous larvae, and on the Continent it is only known from *Nematus fraxini* and *N. appendiculatus* in Prussia and Bavaria.

H. vexata is also omitted, since no one has mentioned it here and I know nothing of Marshall's authority for placing it in his catalogues; Thomson says it differs from the whole remainder of the genus in having the head not posteriorly dilated, and the hind femora black.

Table of Species.

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|------|---|--------------------------------|
| (2). | 1. Vertex explanate behind the eyes;
hind femora black | 1. INCRASSATOR, <i>Holmgr.</i> |
| (1). | 2. Vertex not posteriorly dilated; hind
femora always red. | |
| (4). | 3. Mandibles basally reflexed below;
speculum dull | 2. CLANDESTINA, <i>Holmgr.</i> |
| (3). | 4. Mandibles not basally reflexed;
speculum nitidulous. | |
| (6). | 5. Ventral plica infusate; mandibles
short and stout | 3. ERYTHROPYGA, <i>Holmgr.</i> |
| (5). | 6. Ventral plica stramineous; mandibles
not stout. | |
| (8). | 7. Head posteriorly constricted; hind
tibiae subimmaculate | 4. ARGENTATA, <i>Grav.</i> |
| (7). | 8. Head hardly constricted; hind tibiae
infusate-marked | 5. PUBESCENS, <i>Ratz.</i> |

1. *incrassator*, *Holmgr.*

Campoplex transiens, Ratz. Ichn. d. Forst. ii. 84 (?). *C. incrassator*, Holmgr. Sv. Ak. Handl. 1854, p. 18, ♂ ♀. *Limneria incrassata*, Holmgr. lib. cit. 1858, p. 89; Bridg.-Fitch, Entom. 1885, p. 207, ♂ ♀. *Holocremna incrassata*, Thoms. O.E. xi. 1177, ♂ ♀.

Black with the abdomen apically, or also centrally, castaneous; anterior femora nearly entirely and their tibiae red, hind tarsi short and ferruginous, their coxae and trochanters and femora black or the last piceous, and their tibiae usually apically and before the base nigrescent; wings hyaline with areolet broadly sessile; mesopleurae nitidulous and not very coarsely punctate; antennae not longer than half the body and apically but little attenuate. Length, 7 mm.

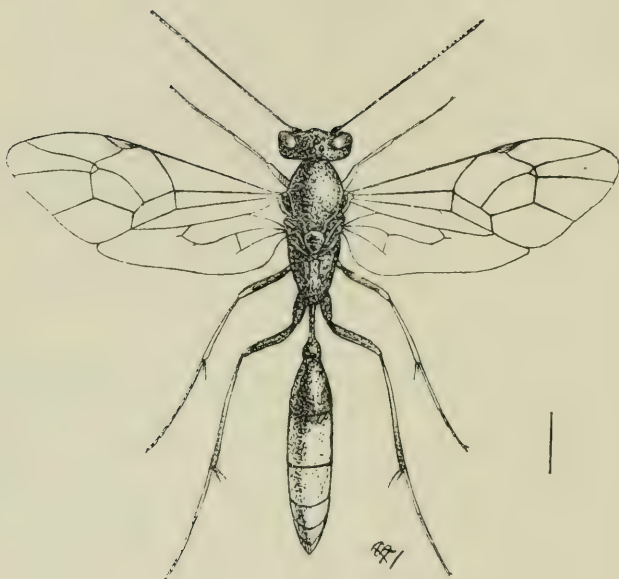
This is one of the largest of the genus and differs from all its other species in having the head distinctly a little explanate posteriorly; the structure of the flagellum and hind pedal colouration are also distinctive. I have not seen the male but in my females the very stout abdomen is no more than dull badius from centre of third segment with anus indefinitely darker, and the hind tibiae no paler but dark castaneous with extreme base and apex merging into black. It is a striking insect, somewhat resembling a modified form of *Phaenogenes cephalotes*.

Holmgren gives four or five Swedish localities, though no situations; and Thomson simply refers to it as rare in north and central Europe. Ratzeburg's insect, thought probably synonymous by the latter, was raised in Germany from *Strongylogaster cingulatus*, and is recorded from France. It was introduced as British by Marshall (Entom. 1872, p. 432) on the strength of Francis Walker's Isle of Man capture; but the record (Proc. S. Lond. Ent. Soc. 1896, p. 85) of both sexes having been bred from larvae of *Eupethecia expallidata* must be an error; it is certainly very rare with us and I find no further mention of it; I possess but three specimens, taken by Piffard at Felden in Hertfordshire and by myself at Holiday Hill in the New Forest on 18th June, 1907, and at Ventnor in the Isle of Wight on 29th of the same month.



Meloboris crassicornis, Grav.

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Holocremna incrassator, *Holmgr.*

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2. *clandestina*, Holmgr.

Campoplex relictus, Htg. Jahresb. 1838, p. 272; Ratz. Ichn. d. Forst. i. 94, ♀ (?). *Limneria clandestina*, Holmgr. Sv. Ak. Handl. 1858, p. 90; Bridg.-Fitch, Entom. 1885, pp. 108, 205, ♂ ♀. *Holocremna clandestina*, Thoms. O.E. xi. 1178, ♂ ♀.

Head hardly constricted behind the eyes with cheeks somewhat short and convex, their costa strongly inflexed; palpi and mandibles flavous, the latter short and stout, but little longer than broad and basally reflexed below, with the teeth not acute. Antennal scape pale beneath. Thorax dull and grey pubescent; mesopleurae alutaceously punctate with speculum dull; areola semicircular and apically incomplete, with the costulae subobsolete. Abdomen with apical margin of second segment usually and of third rarely red, sides of the third generally concolorous; the following segments usually rufescent below; postpetiole laterally subparallel-sided; ventral plica infusate. Legs rufescent with anterior coxae and all trochanters flavidous; hind coxae and basal joint of their trochanters black; hind tibiae rufescent with apex, and usually before the white base, infusate; hind tarsi piceous. Wings with tegulae pale, stigma piceous and apex of discoidal cell acute below. Length, 7–8 mm.

Known by the capital characters, the nearly parallel-sided postpetiole and immaculate red hind femora.

Roth found a few specimens at Ilstorp in Sweden in the middle of July and it is recorded from Lapland by Thomson, who thought Hartig's insect, bred from *Lophyrus pini* in Germany, probably synonymous. But our records of this species, introduced with no locality by Bridgman (Trans. Ent. Soc. 1882, p. 150), are all from Lepidopterous hosts and should, consequently, be regarded with suspicion:—Bignell bred it from *Lomaspilis marginata* (Entom. 1881, p. 140) and Adkin a female and two males from Rannoch larvae of *Eupithecia helveticaria* (Proc. S. Lond. Ent. Soc. 1896, p. 80). Dalla Torre—doubtless in error for *H. pubescens*—says Fletcher raised it from *Croesus varus*. I possess half-a-dozen examples from Shere in Capron's collection and others from Felden in Piffard's, Bentley Woods and Marlesford, Suffolk, on *Theracium* flowers in August and July.

3. *erythropyga*, Holmgr.

Limneria erythropyga, Holmgr. Sv. Ak. Handl. 1858, p. 91; Brisch. Schr. Nat. Ges. Danz. 1880, p. 166; Bridg.-Fitch, Entom. 1885, pp. 108, 205, ♂ ♀. *Holocremna erythropyga*, Thoms. O.E. xi. 1181, ♀.

Black with the palpi, mandibles, underside of scape and callosities before radices, flavidous; mandibles short and stout. Thorax with mesopleurae somewhat nitidulous and diffusely punctate; areola pentagonal, somewhat narrow and apically incomplete, with weak but distinct costulae. Abdomen with the incisures of second segment often, the third usually laterally and the following below, rufescent; postpetiole transverse and but little convex, with sides nearly straight; ventral plica infusate; terebra not extending beyond anus. Legs red, with the anterior basally flavidous; hind coxae and basal joint of their trochanters black, their femora sometimes apically with apex and before base of their tibiae nigrescent, extreme base of hind tibiae with those of basal

hind tarsal joints white. Wings with tegulae stramineous and stigma piceous. Length, 7 mm.

Known by its coarctate body, stout femora with the hind ones apically and their tibiae both apically and before the base infusate, the strongly inequal calcaria, black and at the base discally white hind tarsi, and the subtransverse postpetiole and second segment.

It seems very rare on the Continent; Holmgren found it from the middle of July to early August in Sweden and southern Lapland; and Brischke bred it in Prussia from larvae of *Tenthredo* sp., though it is not certain that his species is the same. Bridgman took this insect (Trans. Norf. Soc. 1894, p. 620) at Norwich and Brundall in June and July; and Bignell captured it at Exeter on 17th August. I have a couple of females from Surrey.

4. *argentata*, Grav.

Campoplex argentatus, Gr. I.E. iii. 543, ♀; Holmgr. Sv. Ak. Handl. 1854, p. 20, ♂ ♀ (nec Ratz.). *Limneria argentata*, Holmgr. lib. cit. 1858, p. 81; Brisch. Schr. Nat. Ges. Danz. 1880, p. 165 et 1892, p. 45; Bridg.-Fitch, Entom. 1885, p. 205, ♂ ♀. *Holocremna argentata*, Thoms. O.E. xi. 1181, ♂ ♀.

Black with the abdomen towards its apex and the legs pale ochraceous. Head a little narrowed behind the eyes; mandibles pale, not stout and longer than basally broad, with acute teeth and their base not reflexed below. Palpi, underside of scape and callosity before radices stramineous; mesopleurae alutaceous, hardly punctate and somewhat dull, with speculum little nitidulous; costulae obsolete or wanting. Abdomen black with apical margin of second segment, the third except discally at its base and at least sides of the following, rufescent; postpetiole subtransverse or in ♂ quadrate; ventral plica flavous. Legs pale fulvous, with hind coxae and basal joint of their trochanters black; hind tibiae hardly or rarely infusate at apex and before the white base; hind tarsi pale, with joints apically nigrescent; anterior coxae stramineous; inner intermediate calcar hardly double length of the outer. Tegulae stramineous and stigma piceous. Length, 6 mm.

Known by the pale ventral plica and humeral callosities, the subimmaculate hind tibiae and posteriorly distinctly constricted head.

Not uncommon throughout Sweden, Germany, France and probably Belgium. It does not appear to have yet been bred with any certainty; the six species of *Lophyrus* referred to as hosts by Dalla Torre certainly apply to Ratzeburg's species (= *H. cothurnata*, Holmgr.), not yet known as British; and of Rondani's record from *Cladius uncinatus* and *Croesus septentrionalis* I know nothing. Giraud in 1877 professed to know it from such different hosts as *Cimbex variabilis* and *Halias chlorana*; to which Gaulle adds *Pteronius ribesii*. Bridgman found the present species at Earlham in August, and Bignell captured it at Pounds near Plymouth on 31st July; I have a full series from Surrey in Capron's collection and other examples from Guildford from Butler and Tostock from Tuck; and I have once or twice swept it myself after dark in Herringswell Fen in Suffolk.

5. *pubescens*, Ratz.

Campoplex pubescens, Ratz. Ichn. d. Forst. i. 96; iii. 86. *Limneria hyalinata*, Holmgr. Sv. Ak. Handl. 1858, p. 93; Brisch. Schr. Nat. Ges. Danz. 1880, p. 166; Bridg.-Fitch, Entom. 1885, p. 108, ♂ ♀. *Holocremna pubescens*, Thoms. O.E. xi. 1182, ♂ ♀.

Black and densely sericeous-pubescent, with the abdomen centrally castaneous. Length, 5-6 mm.

Very like the last-described species, but longer; the metanotal areola and postpetiole longer than broad; the stigma testaceous and more elongate; the hind coxae of the ♂ piceous-rufescent, with their trochanters entirely whitish, and their tarsi broadly white-banded. The extent of central abdominal rufescence appears variable.

Lapland, Sweden and Germany, where at first Ratzeburg bred a male from *Cimbex lucorum*, next Nordlinger raised it in May at Hohenheim from *C. Amerinae* and later (iii. 255) from *C. variabilis*, from the larvae of which Brischke also raised it, while Boheman found it emerged from the pupa of *C. femorata*. We have but a single record (Trans. Ent. Soc. 1882, p. 150) "Mr. J. E. Fletcher has bred both sexes of a *Limneria*, which I believe to be this species, from *Croesus varus*," says Bridgman.

TRIBE PRISTOMERIDES.

This Tribe is instantly recognised from all other Ophioninae by the strong tooth beneath the hind femora, in fact very few Ichneumonidae have so conspicuous a distinguishing feature, which is shared only by certain Xoridides, treated of in my third volume of the present work. This tribe has hitherto been placed in juxtaposition to the Cremastides, and perhaps a more natural sequence would be found hence through that Tribe to the Campoplegid genus *Nemeritis*. No one who has studied exotic forms, however, can have a doubt of the very close association of the present Tribe with the Anomalides and indeed, in such genera as the neotropical *Eiphosoma*, treated of under the latter in my Revision of the Ichneumonidae, ii., it is extremely difficult to draw a line of demarcation. Only a single palaearctic genus, with two or three European species, is known.*

PRISTOMERUS, *Curtis*.

Curt., B.E. xiii, 1836; *Pachymerus*, Gr. I.E. iii. (1829), 721 (*nec* Thunb.).

Head transverse and not buccate; eyes in ♀ slightly and in ♂ strongly convergent above; ocelli subcontiguous with eyes; clypeus basally discreted and apically rounded; mandibular teeth of equal length. Antennæ short and not reaching beyond apex of thorax, with the flagellum

* Genus DEMOPHORUS, *Thomson*.

Thoms. O.E. xiv. 1890, 1457; (?) *Dimophora*, Fst. Ver. pr. Rheinl. 1868, p. 155.

This interesting genus, which Brischke did not describe though he assigned three Prussian species to it, was treated of by Thomson, along with *Pristomerus*, at the end of his paper on *Cremastus*; Schmiedeknecht has placed it actually in the Pristomerides, though acknowledging its utter lack of femoral dentitions. I fail to see the least relationship between *Demophorus* and either of these genera, so remarkable for their large stigma, while here it is of no more than normal size: the position assigned it by Brischke, between *Canidiella* and *Nemeritis* even, is more tenable. A careful examination has convinced me that we have here an aberrant Cryptid; and I am sorry to have omitted this genus from the second volume of *Ichn. Brit.*, for the whole conformation with two exceptions cannot be distinguished from that of *Idiolispa* (*cf. lib. cit.* ii. 296). These two exceptions are found in the neurulation and, to a less extent, the metathoracic structure, for the spiracles here are small and circular with traces—by no means complete areae with strong costae as stated by Schmiedeknecht (O.I. 2013), but somewhat distinct traces—of metanotal areae, such as are often apparent in species of *Spilocryptus*; the other exception is remarkable for the very short basal radial abscissa and subcircular, subpetiolate areolet with very thick nervures. The points of analogy are entirely obvious and in every other particular *Demophorus* agrees *ad amussim* with my description (*loc. cit.*) of *Idiolispa*, notably in the whole abdominal structure, especially the basal segment and deflexed terebra, the abruptly declivell head and metathorax, elongate hind legs and calcaria. I do not find that the central segments are, as stated by Schm., at all rugose-striate; they are on the contrary particularly nitidulous.

We have some right to a second species of this genus in Britain, since Stephens (*Illus. M. vii.* 213) recorded from Darenth Wood *Mesoleptus evanialis*, Grav. (I.E. ii. 16), which Flankuch found synonymous with *Dimorpha cognata*, Brisch. Schr. Danz. 1880, p. 177; but I have no faith in this record.

1. *robustus*, *Brisch*.

Dimophora robusta, Brisch. Schr. Nat. Ges. Danz. 1880, p. 156, ♂ ♀. *Demophorus arenicola*, Thoms. O.E. xiv. 1457, ♂ ♀.

Head and thorax finely and closely alutaceo-punctate and somewhat shining, with short pubescence; the former short, scarcely constricted but abruptly declivell posteriorly. Antennae of ♀ not very long, of ♂ nearly as long as body. Thorax convex, with the discal areae of the short metathorax obsolete but traceable. Scutellum not deplanate, only basally margined. Abdomen black with the second to fourth segments and apex of first broadly red in ♀, and the second and third with postpetiole red in ♂; basal segment glabrous; four apical segments of ♀ subcompressed; valvulae of ♂ subelongate; terebra about half length of abdomen, deflexed. Legs red with coxae and trochanters black, and hind tarsi piceous. Recurrent nervure emitted before centre of the strong areolet; nervellus subgeniculate below its centre. Length, 5.7 mm.

Thomson records it from Norway, Sweden and Germany, where Schm. finds it commonly in summer, usually on sunny hill sides. It was consequently to be expected with us, though not hitherto recorded. The late Alfred Beaumont took several specimens, of which he was so good as to give me some, in just such a situation as the above on Box Hill in Surrey on 31st July, 1897.

apically attenuate. Metathoracic areae complete. Abdomen somewhat distinctly compressed laterally with the first segment stout and its spiracles slightly beyond the centre; second a little longer than broad, with its basal half aciculate; terebra slender and at least half abdominal length. Legs stout with the hind femora incrassate and bearing a strong and oblique tooth beneath beyond their centre, between which and their apex are serrations; hind calcaria unequal; hind onychii longer than penultimate tarsal joint and slightly broader; claws pectinate. Areolet entirely wanting; stigma very broad; lower outer angle of discoidal cell subacute; nervellus intercepted below its centre.

1. *vulnerator*, Panz.

Ichneumon vulnerator, Panz., F.G. lxxii, 1799, 5, ♂. *Ophion vulnerator*, Panz. Krit. Revis. ii, 1806, 90; Gr. Ubers. 1807, p. 268; Beit. Ent. Schles. 1829, p. 13, pl. i, fig. 1, ♂ ♀. *Anomalon vulnerator*, Jur. Nouv. Méth. 1807, 116. *Pachymerus vulnerator*, Gr. I.E. iii. 724; Ratz. Ichn. d. Forst. i. 103; Holmgr. Sv. Ak. Handl. 1854, p. 26, ♂ ♀. *Pristomerus vulnerator*, Curt. B.E. pl. dxxiv. ♂; Farm. Ins. 414; Holmgr. Sv. Ak. Handl. 1858, p. 146; Thoms. O.E. xiv. 1456, ♂ ♀.

Head somewhat constricted behind the eyes, black with the mandibles mainly and palpi flavidous. Antennae subfiliform, with the scrobes distinct and scape rarely red. Thorax stout, finely punctate, very dull and as broad as the head; notauli distinct; metathorax with five distinct areae, of which the areola is longer than broad and pentagonal. Abdomen with the basally aciculate second and the third segment usually apically brick-red, sometimes all the segments are apically pale; ventral plica flavidous; terebra nearly as long as abdomen. Legs red with coxae and usually trochanteral base, sometimes also the hind femora, black; hind tibiae at least apically infuscate; hind femoral tooth large and acuminate. Wings slightly infumate, broad and apically obtuse with stigma piceous, tegulae flavidous to piceous and the recurrent nervures far apart. Length, 6–8 mm.

The only species with black thorax and facial orbits.

It is said to occur throughout Europe, to be somewhat common in Belgium but scarce in Thuringia; Marshall has given it me from Nantua, and Chapman a male bred from *Luffia paucillmana* and females from *Acrobasis porphyrella* both at Cannes early in May, 1901. In Prussia Brischke raised it "aus Maden von *Coenosia* in *Pteris* und aus Raupen von *Carpocapsa pomonana*, *Retinia Buoliana* und *Tortrix Bergmanniana* Cocon cylindrisch, dünnhäutig, weiss, aussen glänzend" (Schr. Nat. Ges. Danz. 1880, p. 197); Gaulle adds the dipterous *Anthomyia albimana* and Hartig also had raised it from *Tortrix Buoliana* (Jahresb. 207). This species should certainly be cultivated as one of the most beneficial to apple-trees, for on 17th and 22nd of July, 1908, I took a nice series, comprising both sexes, on the window in Monks Soham House, Suffolk, of a lumber-room in which apples had been stored during the winter; these had almost certainly emerged from *C. pomonana*, since this moth also was very common on the same windows along with it, though the first appeared on the 13th inst. (cf. Zoologist, 1909, p. 213). Curtis records it in Farm Insects from *Depressaria daucella* "and other kindred species; both sexes frequent the parsnip when in flower, in the beginning of July, and have been taken in the market gardens round London." Nevertheless, it

is very rarely seen abroad and I have never found it wild myself; Bignell took it at Budleigh Salterton in South Devon as early as 15th June; and I possess a few specimens captured on 29th July, 1900, at Tostock in Suffolk (Tuck); at Chiswick (Sich); near Bristol during September (Charbonnier); and by sweeping long grass about 7 p.m. at Eriswell in Suffolk on 26th August, 1906 (Elliott). In 1909 I saw this species in Col. Nurse's collection from the last-named county, labelled as bred from *Sesia cynipiformis*; this was so different a host from any previously assigned it that I asked him for details of its breeding, and he replied "I am positive, as far as one can be if not bred from larva. It certainly came out of a cocoon of *S. cynipiformis*. I took a number of pupae of this clearwing moth this spring and when I found one apparently ichneumonid, I put it in a small glass-topped box separately, labelled. There was no orchard within a mile of where I got these pupae."

TRIBE

ANOMALIDES.

This is one of the Tribes already treated of in my "Revision" of the world's Ichneumonidae (1913, p. 49), and is of more than ordinary interest on account of the extremely characteristic facies of its members, all of which are unlike any other Hymenoptera in their caudiformly produced metathoracic apex, extremely slender and very strongly compressed abdomen with its linear basal segment and always but shortly exerted terebra, as well as the always more or less spatuliformly explanate hind tarsi, which are similar in this respect to the Braconidous genus *Pachylomma* and certain males of the Dipterous Empidae. The neuration is also remarkable and the peculiarly narrow wings invariably lack areolet, have the stigma narrow (unlike the earlier Tribes of Ophioninae) and the second recurrent nervure, by its emission from the cubital only slightly or not at all before the submarginal—indeed, in *Gravenhorstia* the emission is beyond it—shows affinity with the Ophionides, not continued in the remarkably rugose metathorax of the present group. They are quite certainly most closely allied to the *Pristomerides*, through the neotropical and Sonoran genus *Eiphosoma* which, excepting its femoral tooth, is entirely Anomaloid.

The Anomalides is a cosmopolitan group, known from every Continent, rarest in South America and Africa south of the Sahara, most prolific in species in the nearctic region; the European kinds have now been comparatively well worked, and are distinctly few in number of species; the British kinds, with but few exceptions, are of uncommon occurrence, though those exceptions are invariably to be met with in sylvan places, especially in oak woods where Winter Moths abound, in spring, dancing over rough herbage and hovering at the twigs of trees. Economically they are exclusively attached at the Lepidoptera, among which they are known to be unusually beneficial in slaying species of peculiar annoyance to man.

Table of Genera.

- | | | | |
|-------|----|--|---------------------------|
| (16). | 1. | Second recurrent not emitted before submarginal nervure; face not cornute. | |
| (7). | 2. | First recurrent emitted from centre of first cubital cell. | |
| (6). | 3. | First hind tarsal joint at most twice longer than second. | |
| (5). | 4. | Clypeus apically bilobed and strongly reflexed | SCHIZOLOMA, <i>Wesm.</i> |
| (4). | 5. | Clypeus apically truncate and not reflexed | EXOCHILUM, <i>Wesm.</i> |
| (3). | 6. | First hind tarsal joint fully thrice length of second | HETEROPELMA, <i>Wesm.</i> |
| (2). | 7. | First recurrent emitted from distinctly before centre of cubital cell. | |
| (9). | 8. | Eyes distinctly pubescent; scutellum apically incised | TRICHOMMA, <i>Wesm.</i> |
| (8). | 9. | Eyes glabrous; scutellum not apically emarginate. | |

- (11). 10. Second recurrent continuous with submarginal nervure ERIGORGUS, *Först*
 (10). 11. Second recurrent emitted from cubital distinctly beyond submarginal.
 (13). 12. Anal nervure emitted below centre of the externally explanate brachial cell ANOMALON, *Jur.*
 (12). 13. Anal nervure at or above centre of the parallel-sided brachial cell.
 (15). 14. Nervellus of hind wing distinctly intercepted LABRORYCHUS, *Först.*
 (14). 15. Nervellus of hind wing not at all intercepted AGRYPON, *Först.*
 (1). 16. Second recurrent emitted before submarginal; face cornute GRAVENHORSTIA, *Boie.*

SCHIZOLOMA, *Wesmael.*

Wesm. Bul. Ac. Brux. 1849, p. 118; *Schizopoma*, Först. Verh. pr. Rheinl. 1868, p. 145.

Head closely punctate and sometimes posteriorly buccate; clypeus apically reflexed and centrally emarginate; frons dentate and eyes large. Antennae subfiliform and somewhat slender, not as long as body. Thorax coarsely punctate, with notauli broad and usually deeply impressed; metathorax reticulate and irregularly costate, with basal transcarina and costulae usually traceable, its apex produced and strongly elevated on either side. Scutellum discally deplanate, centrally longitudinally excavate. Hind legs somewhat stout, the two basal tarsal joints explanate and in ♂ spatuliform with the second nitidulous, and in both sexes fully half length of the first; claws very strongly geniculate, small and basally lobed.

The neururation differs in no essential particular from that of the next genus. Only our two indigenous kinds are known in Europe, though an Indian and American species have also been described. The females here brought forward are very similar and have hitherto been mixed under the first species.

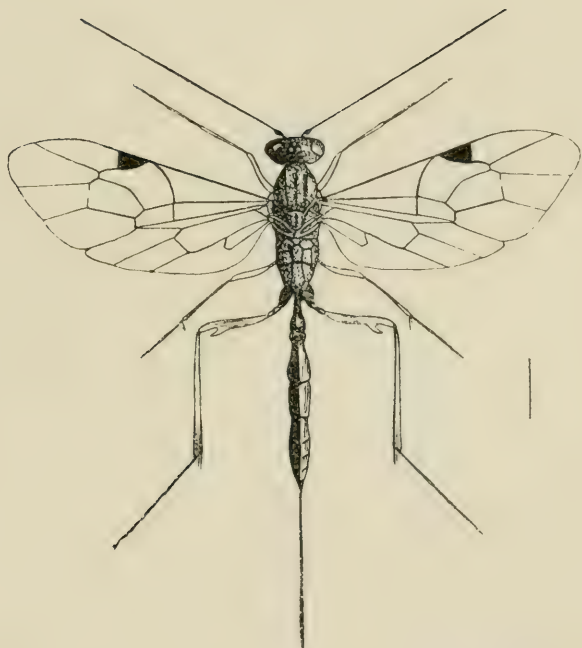
Table of Species.

- (2). 1. Wings acuminate; radial cell narrow; metanotal costae longitudinal . . 1. AMICTA, *Fab.*
 (1). 2. Wings subobtusely; radial cell broader; metanotal costae radiate . . . 2. CAPITATA, *Desc.*

1. *amicta*, *Fab.*

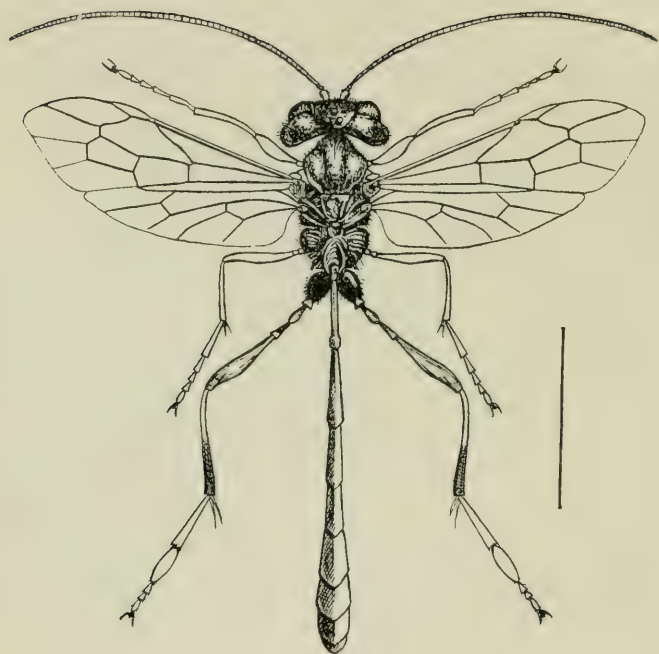
Ichneumon amictus, Fab. S.E. 1775, 341, ♀. *Ophion amictus*, Fab. E.S. Suppl. 1798, 237, ♀. *Anomalon amictum*, Gr. I.E. iii. 650; Ratz. Ichn. d. Forst. i. 88; ii. 77, ♂ ♀. *Therion amictum*, Curt. B.E. pl. 736, ♂. *Schizoloma amictum*, Wesm. Bul. Ac. Brux. 1849, p. 120; Holmgr. Sv. Ak. Handl. 1858, p. 13; Bridg.-Fitch, Entom. 1884, p. 181; Thoms. O.E. xvi. 1757, ♂ ♀.

A black and red, large species. Head not broader than eyes, temples not very buccate, of ♀ subconstricted; cheeks not buccate; face, mouth and rarely a vertical dot flavous. Antennae bright fulvous with the scape flavous beneath, and nearly always their basal half nigrescent. Thorax



Pristomerus vulnerator, *Panz.*

(page 223)



Schizoloma capitata, *Desv.*

(page 228)

dull; metathorax deplanate with irregular longitudinal carinae not radiating from the obsolete areola, and centrally sulcate, with basal transcarina often distinct. Abdomen and legs dark or clear red with the second and sometimes the first segment discally, with apical third of hind tibiae, alone black. Wings hyaline or subflavescent, apically subacuminate; stigma clear red, with nervures darker; radial cell narrow and lanceolate; submarginal nervure as long as space between the second recurrent and disco-cubital nervure, which latter is thence straight to its fenestra. Length, 20–27 mm.

The longitudinally multicarinate metathorax, subacuminate front wings and narrow radial cell will distinguish this from the next species.

This species was originally described from the now headless female, still preserved in the Banksian collection in Mus. Brit. (Entom. 1909, p. 137), "Habitat in Anglia." It does not appear to be generally distributed on the Continent, though mentioned from Sweden, France, Belgium and Gravenhorst records it from Silesia in August, Italy, etc., and bred from the larva or pupa of *Bombyx processionea*, as noted by Ratzeburg who probably raised it from *Sphinx pinastri* (vol. i) and certainly from *Bombyx rubi* and on 21st May from *Bombyx bucephala* (vol. ii). It has further been bred from *Callimorpha dominula* at Munich (Bucherer coll. in Mus. Brit.), *Dasychira pudibunda* and *Hylophila prasinana* (Brischke), *Rhizolitia* sp. (Giraud, Ann. Soc. Fr. 1877, p. 405 = *Xylina rhizolitia*, Bridg.-Fitch) abroad. With us it is "not uncommon in Britain . . . it is solitary in its parasitism . . . the larva makes a very thin cocoon and emerges direct from the pupa of its host," as Bridg.-Fitch truly say; they could, however, only record it from *Cucullia* sp. (in Mus. Brit.), doubtfully from *Demas coryli* and from *Eupithecia linariata*—a wondrous small host—from which Bignell bred it on 30th May and further took it at Ivybridge in Devon on 3rd June. The male, figured by Curtis, was captured by Mr. C. Lyell at Kinnordy in Forfarshire. I have seen it from Guernsey and Alderney* (Luff), Hastings (in the Museum there), Bantry in south-west Ireland (T. B. Fletcher), ex *Hadena oleracea* (Marshall coll.); and possess it from Bewdley (W. Ellis), Ipswich in 1893 (Morley), Forbes

* I have known this species well for more than twenty years, and when it first came under my observation I thus described it:—Head black; face (continued along the orbits of the eyes to a level with the ocelli), a streak at the outer orbits of the eyes, clypeus, mandibles (for the most part) and palpi testaceous or flavous; coarsely punctate, distinctly on the top, much more finely at the sides behind the eyes, and coarsely, indistinctly on the face: apical margin of clypeus rufescent, raised and very distinctly bilobed; mandibles darker at their apices which are furnished with two teeth the upper being distinctly longer than the lower; mandibles punctate and pubescent, margined on, at least, their lower side; head much broadened and thickened behind the eyes (viewed from above); reminding one of *Paniscus cephalotes*, though broader), posterior margin of head with a distinct margin and furnished with rufescent pubescence. A flattened black horn on the frons, just above and between the insertion of the antennae. Antennae rufescent, becoming testaceous towards their apices; scape red, flavous beneath, with small black spot above; reaching to about the apex of the second segment of the abdomen. Thorax black and pubescent; mesothorax and the flattened scutellum finely and evenly scabrous, two small spots on either side of the postscutellum and a spot before the insertion of the front wings obscurely ferrugineous; metathorax with a central longitudinal depressed line, whence five or six carinae run obliquely to the lateral margins; apex abruptly constricted, produced into a small tooth on either side of the insertion of the petiole; metathoracic spiracles oblong. Abdomen glabrous, shining, rufescent; petiole red, abruptly constricted just beyond its base; spiracles placed near the apex; second segment red, its dorsum distinctly and abruptly quite black; following segments rufescent, becoming infusate towards the apex. Legs flavidous; basal half, especially above, of hind coxae and apex of hind tibiae black; hind trochanters and femora testaceous; tarsal claws simple, broadened and flattened at their bases, pulvilli black; first joint of the hind tarsi about half as long again as the second; these two joints about as broad as the third is long, pubescent; second joint viewed from beneath appears hollowed out like a canoe, sulcate. Wings somewhat fulvescent; veins brown; stigma, base of costa, and tegulae fulvous; anal nerve intercepts the posterior discoidal recurrent in about the centre; interior discoidal recurrent meeting the prebrachial at the centre of the first cubital cell (just below base of stigma) and forming with it an almost straight line through the centre of the wing. Length, 23 mm. ♂ in coll. Luff; Alderney.

in Elgin, Sept., 1892 (Chitty) and Valentia Island, off Ireland, in August, 1901 (E.M.M. 1902, p. 55). But, though not hitherto bred thence, *Aplecta nebulosa* appears to be its principal host and Delamere Forest in Cheshire its headquarters with us, since all the following came thence from that Noctuid:—I bred five examples towards the end of June and at the beginning of July, 1909, each from a pupa taken by Mainsbridge and received the preceding May; South kindly sent me a male on 27th June, 1903, which had but just emerged; on 13th to 18th of the same month Bankes bred several; and in 1907 Hugh Main sent a beautiful pair from these pupae, whose larvae were taken there on the 1st of the preceding April, with the remark that the “parasites emerge at the same time as their hosts, always from the pupae.”

2. *capitata*, Desv.

Anomalon capitatum, Desv. Cat. 104, ♂. *A. amictum*, Voll. Pinac. pl. iii, figg. 5—5c, ♀ (nec Fab.). *Exochilum capitatum*, Bridg. Trans. Ent. Soc. 1886, p. 344, ♂. *Schizoloma bucephalum*, Brauns, Arch. Nat. Meckl. 1898, p. 71, ♂. *S. capitatum*, Schm. Opusc. Ichtn. p. 1463, ♂.

At once known from the preceding, which the ♀ so strongly resembles as not to have been hitherto recognised, by the less acuminate front wings with shorter and broader radial cell, submarginal nervure but half length of space between second recurrent and disco-cubital nervure, which latter is thence somewhat distinctly curved to its fenestra; also recognised by the metanotal carinae, which are not longitudinal but radiate obliquely from the obsolete areola on either side; the ♂ is very distinct in its enormously buccate temples, much broader than eyes. Length, ♂ 21–23 mm. (Desv.); ♀ 25 mm.

Bridgman was led into error regarding its genus by W. F. Kirby who, on examining the types, still in Mus. Brit., erroneously told him there was no frontal horn, and overlooked the clypeal reflection which is strong.

Desvignes' types are said by him to have come from Yorkshire; and we have no subsequent records. Brauns redescribed the male from Germany in 1898 and Schmiedeknecht says all the males of this genus he has taken in Thuringia belong here, adding that it has been reared from *Smerinthus populi*. I have seen no English examples but the types in Mus. Brit. and possess but a single pair, of which the new female was taken at Cors-y-Gedol near Barmouth in Merioneth by Willoughby Ellis and the male in Guernsey during 1908 by W. A. Luff.

EXOCHILUM, Wesmael.

Wesm. Bul. Ac. Brux. 1849, p. 1109.

Head closely punctate; labrum prominent, clypeus apically very broadly rounded and not at all reflexed; upper mandibular tooth the longer; frontal horn obsolete. Antennae distinctly shorter than body and not very slender. Mesonotum closely punctate. Terebra slightly longer than breadth of anus. Hind calcaria slightly longer than their apical tibial breadth, and their metatarsi about double length of second joint which with the third are, in ♂, somewhat explanate.

Extremely like the two last genera and it might advantageously be united with them, especially in respect to the neururation though here the nervellus is less strongly postfurcal and is intercepted hardly above its centre; this genus differs from both in the simple apex of its clypeus, the hind tarsal lengths, and its usually pale scutellum.

A female of the large and handsome nearctic species, *Exochilum morio*, Fab., with black wings and body, and fulvous antennae, was captured at Bootle by Liverpool on 30th July, 1904, by Mr R. Burgess Sopp, who has kindly presented me with this interesting importation.

Table of Species.

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|---|------------------------|
| (2). 1. Submarginal nervure opposite; scutellum pale; femora half red . . . | 1. CIRCUMFLEXUM, Linn. |
| (1). 2. Submarginal nervure antefurcal; scutellum and hind femora black . . | 2. BREVICORNE, Grav. |

1. *circumflexum*, Linn.

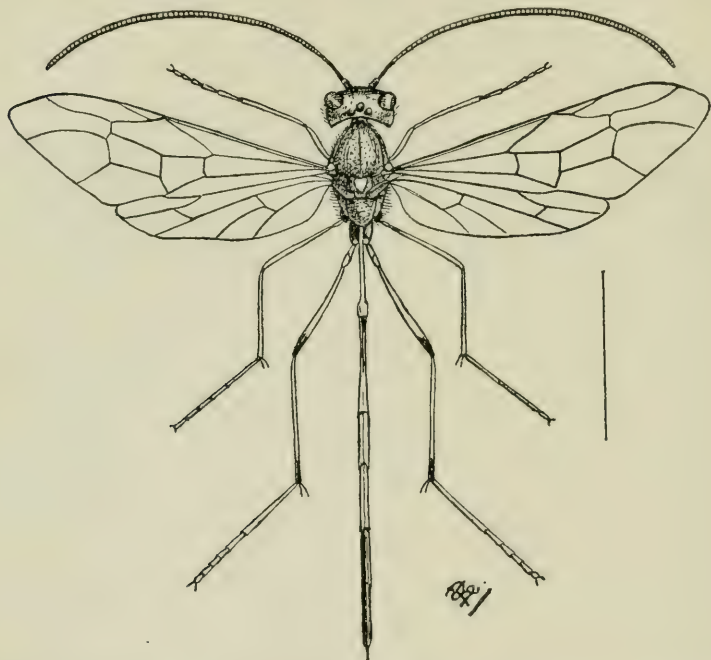
Ichneumon circumflexus, Linn. S.N. 1758, 566; Fab. S.E. 1775, 341. *Ophion circumflexum*, Fab. E.S. Suppl. 1798, 236; Piez. 133. *Anomalon circumflexus*, Jur. Nouv. Méth. 116, ♀; Gr. I.E. iii. 643; Zett. I.L. i. 392; Ratz. Ichn. d. Forst. i. 87, pl. ix, ff. 11–22; ii. 77, ♂ ♀. *Therion circumflexum*, Curt. B.E. fol. 736. *Exochilum circumflexum*, Wesm. Bul. Ac. Brux. 1849, p. 122; Voll. Pinac. pl. iii, fig. 6; Bridg.-Fitch, Entom. 1884, p. 181; Thoms. O.E. xvi. 1759, ♂ ♀. Var. *giganteum*, Grav. I.E. iii. 647; Ratz. Ichn. d. Forst. i. 87, ♂ ♀.

A black and red species. Head with the face of ♂ often entirely pale, of ♀ with usually three flavous longitudinal vittae, confluent below. Antennae bright fulvous, with the usually flavous-marked scape and the basal flagellar joint alone deep black. Thorax black; metanotum deplanate and evenly reticulate throughout. Scutellum always conspicuously flavous. Abdomen red with a discal vitta on second segment, and the anus from fifth or sixth segment, black; basal segment not apically nodose. Legs red, with the anterior paler; coxae, apices of hind tibiae and of their femora black; hind tarsi flavous, basally rufescent. Wings flavescient with stigma and tegulae rufescent; submarginal nervure opposite and distinctly a little longer than space between discoidal and second recurrent nervures; nervellus distinctly a little postfurcal and intercepted slightly above its centre. Length, 14–(Hyères) 25 mm.

The scutellum is said to very rarely be black, but the next species has so recently been placed in its true genus that such records probably refer to it. The variety is broadly red laterally on the pleurae, extends to 30 mm. and is unlikely to occur here.

A common species throughout Europe, where it is found in August on umbelliferous flowers and in pine woods; Schm. took it in northern Africa and Palestine; I have it from Monte Rosa and Hyères, and have seen it from as far east as India. Ratzeburg has given us (*Die Ichneumonien*, i, 80–87 and *Die Waldverderber*, pl. i. et iii) an excellent account of its life-history, which may be taken as typical of the *Anomalides* as a whole; he describes and figures both larva and pupa in detail, and the circumstances, as Bridg.-Fitch say, of the curious tailed young larva and the absence of tracheae, the probability of a double brood, the departure from the normal solitary parasitism in two instances out of over fifty, etc., are of great interest; the parasite emerges direct from the host pupa,

within which it constructs a very delicate cocoon; Ratzeburg and Har-rach raised it from *Lasiocampa pini*, Brischke (Schr. Ges. Danz. 1882, p. 135) both from that species and *Euplexia lucipara* in Prussia; and the var. *giganteum* has been reared from *Bombyx trifolii* by both Ratzeburg and Gravenhorst. With us it is by no means a common insect and I have never seen it alive. Gravenhorst thought Eleazar Albin's pl. vii, representing a British parasite emerged from *Sphinx ligustri*, probably represented the present species, but I consider it certainly a *Trogus*; and Curtis, recording it from Darenth Wood, adds "I believe it has been bred from the caterpillar of *Sphinx ligustri*." Donovan (Brit. Ins. iii, 56, pl. xciii) roughly figured the female in 1794 and says it is not very



commonly found in May and June. Hope took it at Netley and Bignell on 21st June at Bickleigh. I have specimens from Painswick in Glos. (Watkins), the Isle of Wight (Morey) and Whitby on 19th August, 1897 (Beaumont). Stephens took it at Darenth.

2. *brevicorne*, Grav.

Anomalon brevicorne, Gr. I.E. iii. 656, ♂ ♀. *Exochilum brevicorne*, Schm. Opus. Ichn. p. 1466, ♂ ♀; cf. Szépl. Ann. Mus. Nat. Hung. 1905, p. 508.

Extremely like the last species and doubtless hitherto mixed with it in Britain, whence it has not been recorded. Therefrom it differs in its apically nodulose basal segment, the lower interception of the nervellus, much more strongly antefurcal submarginal nervure, which is no longer

than the space between the discoidal and second recurrent nervures, in the trans-strigose and centrally excavate metathorax, black scutellum and more broadly black hind femora. Length, ♀ 20–22 (♂ 18) mm.

It was described from a couple of males from Breslau and a couple of females from a sunny place in Silesia; Szépligeti has recently rediscovered it in Hungary. My females agree exactly with the former's description and certainly belong to the present genus; one has the basal two-thirds of the hind tibiae clear flavous with disc of basal segment partly black, as he alternately describes them.

My two indigenous females were both bred: one on the 20th July, 1900, from an unspecified Noctuid pupa at Lincoln by Mr. J. F. Musham and the second from an *Acronycta myricae*, G., chrysalis, of which it has in emerging bitten off the whole capital extremity in a rough manner, by Mr. H. J. Charbonnier in April, 1890, at Bristol. Giraud tells us (Ann. Soc. Fr. 1877, p. 495) that Perris raised this parasite from *Cucullia scrophulariae* in Corsica.

HETEROPELMA, Wesmæd.

Wesm. Bul. Ac. Brux. 1840, p. 120.

Head slightly constricted posteriorly, closely punctate and rather densely pilose. Antennae shorter than body, pale with their base black. Thorax closely punctate and somewhat densely pubescent; notauli distinct and discally strong; speculum shining and finely punctate; metathorax reticulate-rugose, with no areae, its produced apex discally excavate. Scutellum deplanate, with its centre longitudinally excavate. Basal segment basally reflexed, and extreme apex subexplanate; terebra as long as breadth of anus; with spicula compressed before its apex. Legs slender, with the hind ones elongate and in ♂ their two basal tarsal joints spatuliform; hind metatarsi of both sexes at least thrice longer than second joint, and the penultimate suborbicular; claws geniculate and not pectinate. Wings with first recurrent nervure emitted from median at centre of disco-cubital cell; second recurrent emitted beyond submarginal; lower basal distinctly postfurcal; nervellus postfurcal and intercepted at its upper third.

At once known by the position of the first recurrent nervure and elongate metatarsi; very few species are known and the following alone occurs in Europe.

1. *calcator*, Wesm.

Anomalon xanthopus, Gr. I.E. iii. 652, excl. ♂ (*nec* Schr.). *Heteropelma calcator*, Wesm. Bul. Ac. Brux. 1849, p. 120; Kirchner, Lotos, 1856, p. 234, pl. xi.; Holmgr. Sv. Ak. Handl. 1858, p. 15; Bridg.-Fitch, Entom. 1884, p. 187; Thoms. O.E. xvi. 1758, ♂ ♀.

A black species with the face and mouth flavous, antennae mainly ferrugineous, abdomen clear red with anus from base of sixth segment and a discal vitta on the second black; legs except basally concolorous, with the anterior paler and apices of hind tibiae, sometimes also of their femora, black; wings distinctly flavescent with stigma clear fulvous and nervures darker. Length, 14–17 (or –20 abroad) mm.

This is said to be one of the commonest species of Anomalides on the Continent and to be distributed throughout Europe, where it has been

bred from pupae of *Panolis piniperda* and *Hylophila prasinana* by Brischke, *Fidonia piniaria* by Kawall, from specimens of *Anarta myrtilli* by Schm. and *Larentia variata* by Gaulle. Bridg.-Fitch, however, correctly considered it rare in Britain and there seem to be no records; it must nevertheless be widely distributed, since the two in Mus. Brit. are from Epping Forest and Esher, I possess a female taken at Forres in Elgin during Sept. 1892 (Chitty), another from Cornworthy in Devon (Marshall), and both sexes in July from Miss Chawner and Mr. Adams at Lyndhurst in the New Forest, where I captured a pair on 12th July, 1909, flying over heather at Setley. It is probably attached to fir woods.

TRICHOMMA, *Wesmael*.

Wesm. Bul. Ac. Brux. 1849, p. 119.

Head slightly constricted and weakly rounded behind the eyes, which are large, explanate above and distinctly emarginate next the scrobes, pubescence upon them obvious; face punctate throughout and apically constricted, apex of clypeus centrally dentate. Antennae about three-quarters as long as body, scape apically truncate and hardly emarginate. Thorax with distinct notauli; metathorax apically produced above hind coxae. Scutellum subdeplanate or strongly convex and discally impressed, laterally carinate. Abdomen laterally strongly compressed, with the terebra subelongate. Legs slender, with front tibiae short; basal joint of hind trochanters more than double length of second; hind calcaria hardly longer than their apical tibial breadth; hind tarsi slightly incrassate, with metatarsi at least as long as the remainder united; claws pectinate. Wings narrow with lower basal nervure oblique and postfurcal; brachial cell but little produced apically, emitting parallel nervure from or from about its centre; disco-cubital nervure arcuate; nervellus not or but feebly intercepted.

T. minutum, Bridg., is an *Agrypus*.

Table of Species.

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| (2). | 1. Clypeal tooth small; scutellum sub-sulcate; pleurae striate .. | 1. <i>ENECCATOR</i> , <i>Rossi</i> . |
| (1). | 2. Clypeal tooth strong; scutellum bicarinate; pleurae punctate .. | 2. <i>FULVIDENS</i> , <i>Wesm.</i> |

1. *enecator*, *Rossi*.

Ichneumon enecator, Rossi, F.E. 1790, 48. *Ophion enecator*, Illig. F.E. ii. 1807, 72; Gr. Nov. Acad. Nat. Cur. 1818, p. 294. *Anomalon enecator*, Gr. I.E. iii. 641, ♂ ♀. *Therion enecator*, Curt. B.E. fol. 736; cf. Westw. Introd. Synop. 60. *Trichomma enecator*, Wesm. Bul. Ac. Brux. 1849, p. 137; Voll. Pinac. pl. 43, fig. 9; Bridg.-Fitch, Entom. 1884, p. 227; Thoms. O.E. 1772, ♂ ♀.

Head not short behind the eyes, vertex obliquely striate between ocelli, frons trans-striate; face finely and evenly punctate, strongly constricted apically; clypeus with a very small apical tooth; mouth, clypeus, face, external and usually vertical orbits flavous. Antennae filiform and distinctly short, with scape flavous beneath. Thorax with small callosity below, and sometimes an elongate line before, radices flavous; meso-

pleurae longitudinally striate; metathorax declived throughout and reticulate, with its central sulcus trans-striate. Scutellum laterally or entirely flavous, broad and subdeplanate with a superficial central sulcus; not rarely only red-marked, or entirely black. Abdomen red, with its disc more or less broadly black; terebra just one-third length of abdomen. Legs red with the anterior, and in ♂ hind, coxae flavous; hind tibiae apically nigrescent, and the ♀ coxae sometimes more or less black. Wings small and slightly infumate, with stigma testaceous and nervures darker; parallel nervure emitted from about centre of brachial cell; nervellus not at all intercepted. Length, 9-12.



Known by the striae beneath the radices, and its size. I believe there are two British species mixed under this name, but there is no Continental kind like it and I find no constant distinctive characters: the marsh-specimens from the Broads and Matley Bog are darker, with the scutellum always black and much less coarsely sculptured, and the hind femora more or less nigrescent, the smallest is 8 mm.

Not very common with us nor upon the Continent, apparently nearly confined in its parasitism to the Tortricidae, especially those of *Myrica* and willows; it emerges direct from the host-chrysalis, spinning no cocoon of its own. Brischke bred it in Prussia from pupae of *Earias*

clorana, and Gaulle in France from *Acrobasis consociella* and *Lymantria dispar*. Dr. Chapman has given me females just emerged on 22nd June, 1890, from *Acrobasis (Rhodophaca) porphyrea* and *M. fenestrata*; and examples from *Peronea hastiana* were exhibited by Adkin at a Meeting of S. Lond. Soc. Oct. 9th, 1890. Hartley Durrant has given me fourteen examples, of which only three are males, bred by Barrett from *Tortrix decretana* all with pale scutellum, together with a female from *Tortrix sp.* and another from *Psyche villosella*. Tosquinet found this species from June to August in Belgium, but it seems to be confined to the former month with us; Hope took the male at Netley, and it has been bred at King's Lynn by Atmore and by Elisha from *Phlocodes tetraquetana*; Capron found it at Shere, W. Saunders at Greenings in June, 1871, Bignell at Bickleigh early in June, and Bloomfield at Guestling in 1889. I swept two females from rank herbage in Surlingham Marsh in the Norfolk Broads on 10th June, 1901; took another flying about white poplar at Matley Bog in the New Forest on 19th in 1907, and another at the same place three days earlier at the leaves of *Myrica gale* at 11 a.m. in the sunshine; there seems some connection between this species and Sweet Gale, since Lord Walsingham (Entom. 1883, p. 65) bred it from a *Tortrix* pupa, from the same plant.

2. *fulvidens*, Wesm.

Trichomma fulvidens, Wesm. Bul. Ac. Brux. 1849, p. 138; Voll. Pinac. pl. xliii, fig. 8; Bridg.-Fitch, Entom. 1884, p. 227; Schm. Opusc. Ichtn. p. 1469, ♂ ♀. *T. bituberculatum*, Schm. Zeits. Hym.-Dip. 1902, p. 365, ♂.

Head black with clypeus and mandibular mark testaceous; frons and vertex coarsely and irregularly rugose; face laterally flavous, somewhat coarsely and closely punctate; clypeus strongly produced and centrally dentate apically; vertical dots and part of inner orbits flavous. Antennae somewhat stout and nearly as long as body, black with the scape flavous beneath. Thorax black with a mark before and line beneath radices rufescent; mesopleurae closely and coarsely punctate. Scutellum rufescent, strongly convex, basally smooth and shining, deeply impressed sulcate and bicarinate in the centre. Abdomen red with base of first segment, disc of second, and most of anus, black. Legs and coxae red, anterior tibiae flavous; hind coxae, femora and tibiae apically black, with base of the last and the basally nigrescent tarsi flavous. Wings slightly infumate, with stigma testaceous; parallel nervure emitted but slightly above centre of brachial cell; nervellus postfurcal and emitting a weak nervure distinctly above its centre. Length, 15–20 mm.

One of the rarest Anomalides, with a curiously restricted range. It was first described in both sexes by Wesmael, "Hab. in Belgio," where Tosquinet gives it as of rare occurrence at Diest, Boitsfort, Ervox and Carlsbourg; Gaulle records it from France; and Schm. says it is found in Saxony and Thuringia, most often flying round blackberry bushes, from the end of March to that of May. A pair from Ruthe's collection is in Mus. Brit., the female from a *Tortrix* pupa. It must be regarded as only doubtfully British, since with us it is represented by a single female in Desvignes' collection, as recorded in his Cat. (1856, 104), still preserved in the British Museum.

ERIGORGUS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 146, supra; *Barylypa*, l.c. infra.

This is one of the most easily recognised genera of the present group, on account of the submarginal nervure being emitted from the cubital at the same or almost the same point as the second recurrent, and the two thus forming a continuous line through the cubital. In all other respects it is hardly to be distinguished from *Anomalon*. Förster further divided it into *Barylypa*, whose species differed from typical *Erigorgus* in having the parallel (or anal) nervure emitted above the centre of the brachial cell, and these were further subdivided into species with (*Laphytes*) or without the clypeus centrally a little produced; Schmiedeknecht has sunk the former genus and I do not consider so slight a distinction as the position of an anal nervure constitutes generic rank, though that of the submarginal may be placed upon a different footing, since it exhibits distinct transition to the Ophonides and shows the present group allied therewith.

Table of Species.

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| (6). | 1. Anal (parallel) nervure emitted above centre of brachial cell [BARYLYPA, Först.]. | |
| (5). | 2. Antennae very distinctly shorter than the body. | |
| (4). | 3. Hind tibiae entirely black; temples not red-marked | 1. PERSPICILLATOR, Grav. |
| (3). | 4. Hind tibiae mainly rufescent; temples red-marked | 2. INSIDIATOR, Först. |
| (2). | 5. Antennae nearly length of body; hind tibiae pale at base | 3. CARINATUS, Brisch. |
| (1). | 6. Anal nervure emitted from, or from below, centre of brachial cell [ERIGORGUS, Först.]. | |
| (8). | 7. At least the anterior tarsi conspicuously white-banded | 4. FIBULATOR, Grav. |
| (7). | 8. Tarsi black or rufescent, not white-marked. | |
| (10). | 9. Antennae fulvidous; length thirty millimetres | 5. HEROS, Wesm. |
| (9). | 10. Antennae black; length twenty millimetres or less | 6. MELANOBATUS, Grav. |

1. perspicillator, Grav.

Anomalon perspicillator, Gr. I.E. iii. 683; Bridg.-Fitch, Entom. 1884, p. 224, ♂. *Barylypa genalis*, Thoms. O.E. xvi. 1767, ♀. (?) *Laphytes mesozonus*, Först. Verh. pr. Rheinl. 1878, p. 72, ♂.

Head posteriorly broad, with the temples buccate; face punctate; frons rugose and centrally finely carinate; ♀ with face and mouth and cheeks, ♂ with face laterally and centrally, flavidous. Antennae of ♀ a little longer than head and thorax, of ♂ hardly longer than half body, black. Thorax somewhat strongly punctate and pubescent, black; metathorax rugosely punctate, with central sulcus weak. Scutellum subdeplanate and

laterally carinate. Abdomen red with base of first segment, disc of second and anus from base of fifth segment entirely, black. Legs red, with coxae black; front femora at least above and apices of the intermediate rufescent, in ♂ paler; anterior tibiae flavous and internally infusate; hind legs entirely black; ♂ with anterior tarsi partly flavous. Wings slightly infumate, with stigma piceous-flavous or rufescent, nervures nigrescent. Length, 16–19 mm.

Gravenhorst's ♂ may, I think safely, be considered associated with Thomson's ♀ which is certainly the species I know as British; my ♀ has the face, mouth and cheeks pale with only two longitudinal black streaks below the scrobes; one ♂ is concolorous, a second has the orbits and part of mandibles pale, while another has the orbits alone narrowly pale.

All these were acquired from the late J. A. Clark's collection, containing no Ichneumonidae other than bred from Lepidoptera, and these have every appearance of being bred in company. I have seen only one other, but Desvignes had three British specimens in 1856, Bignell bred it in Devon from *Acronycta menyanthidis*, and Capron took a male at Shere in Surrey. It appears to be but indifferently known abroad, and I find it recorded only from Piedmont, Hungary, Sweden; Brischke in Prussia raised it from pupae of *Simyra nervosa* (Schr. Nat. Danz. 1882, p. 137); Giraud in France from *Ctenocampa pithyocampa* (Ann. Soc. Fr. 1877, p. 405); more recently Mocsáry has added *Chloantha hyperici* and *Bombyx castrensis*, and Szépligeti *B. neustria*, to its hosts. Prof. J. W. Carr has shown me a specimen taken in an allotment garden at West Bridgford, Nottingham.

2. *insidiator*, Först.

Laphyctes insidiator, Först. Verh. pr. Rheinl. 1878, p. 73, ♂; Szépl. Term. Fü. 1899, ♂ ♀. *Anomalon cylindricum*, Bridg. Trans. Ent. Soc. 1884, p. 424, ♀. *L. cylindricus*, Schm. Zeits. Hym.-Dip. 1903, p. 78, ♀. *L. insidiator*, Krieg. lib. cit. 1904, p. 173.

Head not explanate behind the eyes; ♀ with face and mouth flavous, ♂ also with vertical dot concolorous; face somewhat closely punctate, frons rugosely punctate with a fine longitudinal carina, clypeus centrally acuminate, temples rufescent. Antennae shorter than body, black with ♂ scape flavous beneath. Thorax immaculate black; mesonotum finely punctate, basally subtrans-strigose; metathorax with distinct central sulcus, basally carinate on either side. Scutellum laterally carinate and hardly deplanate. Abdomen slender, red with the second segment discally, anus from fifth, and in ♂ the first segment to beyond its centre, black; terebra half length of basal segment. Legs slender, with hind tarsi hardly explanate, their joints cylindrical; the anterior rufescent-flavous with coxae nigrescent, ♂ with anterior coxae basally and hind ones entirely black; hind legs piceous-rufescent with coxae and trochanters rufescent-piceous, their femora discally and tibiae apically nigrescent. Wings basally flavescent, stigma testaceous; parallel nervure emitted above centre of brachial cell; nervellus intercepted immediately above its centre. Length, 13–16 mm.

This species agrees with *E. perspicillator* in having antennae distinctly shorter than body, but is at once known by the deep-red temples and its broadly pale hind tibiae. It was described as new by Bridgman but synonymised in 1904 by Krieger, who did not consider *A. carinatum*, Brisch., distinct.

There are said to be two females in Fitch's collection, one of which emerged from *Euchelia jacobacae*; I have another from Chiswick, captured by Sich about 1883 and a broken specimen from Guestling, taken by Bloomfield in 1880. Elsewhere it is known only from Germany.

3. *carinatus*, *Brisch.*

Anomalon carinatum, Brisch. Schr. Nat. Ges. Danz. 1880, p. 136, ♂. *Laphyctes carinatus*, Kreich. Progr. Gym. Pola, 1894, p. 20, ♂ ♀. *A. longicorne*, Brauns, Term. Füz. 1895, p. 46, ♀. *Barytypa longicornis*, Schm. Zeits. Hym.-Dip. 1903, p. 7, ♀.

Head broad with temples buccate; face apically constricted and, with palpi, mandibles, the centrally acuminate clypeus and apices of the broad cheeks, flavous; frons rugose, with an acute central carina; temples deep red. Antennae black, with scape flavidous beneath; nearly as long as body, and in ♀ but little shorter. Thorax immaculate black; mesonotum sparsely punctate and nitidulous; mesopleurae distinctly and confluent punctate, not rugose and speculum not smooth; metathorax reticulate-rugose, with strong central sulcus. Scutellum black, deplanate, laterally carinate and centrally subimpressed. Abdomen red with first segment broadly towards its base, disc of second and anus from fifth or sixth segment, black; terebra black and double length of anal breadth. Legs red with anterior tibiae and tarsi flavidous, coxae and trochanters of ♂ concolorous and of ♀ black with trochanters red; hind legs of ♀ mainly black, of ♂ with coxae and trochanters black, the latter apically flavidous, their femora discally and tibiae apically nigrescent; tarsi not incrassate. Wings with stigma piceous-flavous; tegulae nigrescent, partly dull flavous; parallel nervure emitted above centre of brachial cell; nervellus subcentrally intercepted. Length, 15-18 mm.

The mesopleurae of my ♀ ♀ are not strongly and rugosely punctate, wherein alone they differ from Dr. Brauns' description. The species is distinct in its black scutellum and elongate antennae.

The male, described from Prussia, is said to have been bred from *Arctina caesarea*; Brauns tells us the female was raised from *Phalera bucephala* by Mocsáry at Budapest. But its Continental distribution is uncertain. It has not hitherto been noted in Britain, possibly mixed with *B. insidiator*; but I possess examples from Shere (Capron), a male bred by Mrs. Holmes from *Trachae piniperda* at Sevenoaks in Kent during 1908; and from the New Forest (Miss Chawner), where females occurred to me on heather and rushes near pine woods at Park Hill and Matley Bog on 8th and 13th August, 1901; males were taken on 10th of the preceding month also flying slowly and low, along with *Euthemonia russula*, L., close over heather in a pine wood at Oxshott.

4. *fibulator*, *Grav.*

Anomalon fibulator, Gr. I.E. iii. 681; Holmgr. Sv. Ak. Handl. 1858, p. 21; Voll. Pinac. pl. xliii, fig. 2; Bridg.-Fitch, Entom. 1884, p. 224, ♂ ♀. *A. annulitarse*, Thoms. O.E. xvi. 1764, ♂ ♀.

Head black, elongately pubescent and strongly explanate posteriorly, especially in ♂ which has centre and sides of face and whole or most of

clypeus pale flavous, with vertical dots and outer orbits partly rufescent: ♀ with both inner and outer orbits partly red. Antennae black, with ♂ scape flavous-marked beneath. Thorax black and elongately pubescent. Abdomen red with basal segment nearly entirely, second discally and the anus, black. Legs black with front ones of ♀ mainly red, and of ♂ flavidous with tarsi stramineous-white; hind tarsi with second to fourth joints white, ♀ with apical half of the first concolorous and ♂ with the second sometimes black. Wings somewhat strongly infumate, with stigma rufescent and tegulae black or piceous; nervures infusate. Length, 15–20 mm.

Rarely the anterior tarsi of ♂ alone are white-banded, with hind legs entirely black.

Sparsely distributed through northern and central Europe, Belgium, France, Germany, Sweden, etc. Giraud claims (Ann. Soc. Fr. 1877, p. 405) to have raised it from *Diloba caeruleocephala* and *Bombyx castrensis*. Our first record is by Curtis (B.E. fol. 736) "Isle of Portland 14th May, and beginning of August Heron Court." Weston found this species a frequent parasite of *Zygaena filipendulac*, invariably emerging the first year (Entom. 1880, pp. 17 et 68); and also attacking *Z. Ionicerae* (l.c. 1881, p. 139). It is by no means common, however; no one appears to have captured it and I have no material; a male, thought to belong here by Capron, is referable to *E. perspicillator*, Grav.

5. *Heros*, Wesm.

Anomalon Heros, Wesm. Bull. Ac. Brux. 1849, p. 125, fig. 1, B, ♀; Holmgr. Sv. Ak. Handl. 1858, p. 20; Voll. Pinac. pl. iii, fig. 3; Buysson, Revue d'Ent. 1892, p. 258, pl. i, fig. 5, ♂ ♀. *Habronyx heros*, Först. Verh. pr. Rheinl. 1860, p. 149; Thoms. O.E. xvi. 1759 et xix. 2118, ♀. *Anomalon mirabile*, Desv. Cat. 1856, 105; Bridg.-Fitch, Entom. 1884, p. 224, ♂.

Head black, with the face and mouth and cheeks flavous. Antennae 17 mm. in length, rufescent-fulvous with the two basal joints discally black. Thorax black and white-pubescent, with a flavidous and somewhat elevated line "on the sides of the metathorax, above the base of the wings"; all sutures and frenum dull white. Abdomen rufescent with only the second segment, except at its apex, discally black. Anterior legs flavous; hind ones rufescent with apical third of their tibiae infusate or black; tarsi fulvous or flavous. Wings flavescent hyaline; stigma elongate and very narrow; tegulae infusate-flavidous; "first and second recurrent nervures forming but one continued line" = "nervo secundo recurrente cum nervo, cellulas cubitales sejungente coincidente." Length, 30 mm. ♂ only.

The position of the second recurrent nervure certainly places Desvignes' male described above in *Erigorgus*, but nothing palaearctic much longer than two-thirds of its size is known, except *Habronyx Heros*, with which I was enabled to synonymise it by an examination of the type still preserved in Mr. Desvignes' collection, which is the only known British example; and we cannot yet lay good claim to inclusion in our indigenous list of this species, which is everywhere rare in Germany, Sweden, Belgium, France, etc., from August to October. It is said to have been raised in Prussia from pupae of *Dilephila Galii*, *Lasiocampa pini* and *L. Dryophaga* (Brischke, Schr. Nat. Ges. Danz. 1882, p. 135).

6. *melanobatus*, Grav.

Anomalon melanobatum, Gr. I.E. iii. 662; Voll. Pinac. xliii, fig. 6; Bridg.-Fitch, Entom. 1884, p. 224, ♂. *A. claripenne*, Thoms. O.E. xvi. 1764, ♂ ♀. *Erigorgus similis*, Szépl. Term. Füz. 1899, p. 214, ♂. *E. melanobatus*, Schm. Opusc. Ichn. p. 1489, ♂ ♀. Var. *Anomalon brevicorne*, Först. Verh. pr. Rheinl. 1855, p. 236, ♀ (*nec* Grav.). Var. *A. melanops*, Först. *lib. cit.* p. 234, ♀; *A. varians*, Brauns, Term. Füz. 1895, p. 47, ♀; *Erigorgus interstitialis et flavimanus*, Szépl. l.c. 1899, p. 214, ♂ ♀; *E. purpuratae et apollinis*, Kriech. Ent. Nach. 1900, pp. 172 et 174, ♂ ♀.

Head black; face flavous, rarely with two black vittae or only laterally and centrally pale; ♂ orbits vertically rufescent. Antennae black with the ♂ scape flavous beneath. Thorax black. Abdomen red with basal segment except usually its apex, second discally and anus more or less



broadly, black. Legs red, with anterior of ♂ partly flavous; coxae, part of trochanters, lines on anterior femora and most of the hind ones black; hind tibiae dull red with their apices broadly black, their tarsi rufescent with the basal joints apically, and the apical ones, black. Length, 15-20 mm.

The var. *brevicornis* has the face only laterally pale, the hind femora and basal segment entirely red; the var. *melanops*, considered a good species by Schm., differs from the typical form only in having the hind tarsi entirely flavidous-red with the female face, except rarely an orbital dot, black. I have not found the very possibly synonymous *E. ferruginator*, Grav., to be British.

In Genera Insectorum, 1905, Szépligeti gives this species under both *Anomalon megarthrum*, Ratz. Ichn. d. Forst. ii. 78 and *A. simile*, Szépl. Term. Füz. 1899, p. 214, admitting the synonymy but ignoring Grav.'s priority.

It occurs in Hungary, Sweden, Germany, etc., and is wide spread on the Continent; where Kreichbaumer raised his forms from *Arctia purpurata* and *Parnassius Apollo* respectively. It appears to have been misunderstood in Britain, since Bridg.-Fitch give the parallel nervure emanating above centre of brachial cell, and (perhaps consequently) there is a lack of records. If not common, it is at least of broad distribution with us for I possess it from Romsey in Hampshire (Buckell); Deal in Kent during May, 1872 (Edward Saunders); Barmouth (W. Ellis); as early as 10th April, 1909, Lady Robinson sent me a male from Clumber near Worksop; and on 12th April, 1907, Charbonnier captured two or three specimens of the same sex, one of which is referable to the var. *melanops*, at Cheddar in Somerset, and was much struck by their early appearance, which I find nowhere noted.

ANOMALON, *Jurine*.

Jur. Nouv. Méth. (1807), 114; Gr. I.E. iii. 627.

The typical genus of the present Tribe consists of large and handsome species of varied bright colours. It is easily recognised by the emission of the second recurrent nervure distinctly beyond the submarginal or intercubital nervure, by its face bearing no horn, though the frons in one section is distinctly and finely cornute, by the emission of the first recurrent nervure from very far before centre of the cubital cell, by the glabrous eyes, simple scutellum, and by the emission of the anal or parallel nervure distinctly below the centre of the brachial cell, which is somewhat determinately explanate towards its apex.

It is quite necessary to add Gravenhorst's name to that of the author of this genus, since Jurine included in it a curious medley of species of all kinds of Tribes and even subfamilies. To the old authors this genus represented what we nowadays consider a Tribe, and genera have from time to time been split off as successive authors noted characteristics of more or less generic value; few corners are now left. Förster and more recent writers have divided the present genus into *Aphanistes*, but the distinctions need not be considered generic in our fauna.

Table of Species.

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|------|----|--|---------------------------|
| (8). | 1. | Frons with no central horn; claws not pectinate [ANOMALON, auct.]. | |
| (5). | 2. | Flagellum, part of hind femora, and usually basal segment black. | |
| (4). | 3. | Basal segment mainly black; face rarely all flavous | 1. LATRO, <i>Schr.</i> |
| (3). | 4. | Basal segment clear rufescent; face entirely flavous | 2. CERINOPS, <i>Grav.</i> |
| (2). | 5. | Flagellum, basal segment and femora entirely red. | |
| (7). | 6. | Scutellum black and laterally carinate; flagellum infusate | 3. PROCERUM, <i>Grav.</i> |

- (6). 7. Scutellum flavous and not carinate ;
flagellum fulvous 4. BIGUTTATUM, Grav.
(1). 8. Frons centrally cornute ; claws distinctly
pectinate [APHANISTES, Först.].
(10). 9. Flagellum as long as body, red ;
scutellum carinate 5. RUFICORNE, Grav.
(9). 10. Flagellum short, basally black ;
scutellum mutic.
(12). 11. Scape black ; scutellum strongly
convex 6. XANTHOPUS, Schr.
(11). 12. Scape clear rufescent ; scutellum
not strongly convex 7. BELLICOSUM, Wesm.

1. latro, Schr.

Ichneumon latro, Schr. En. 1781, 360, ♀ ; Vill. Linn. Ent. iii. 181 ; Gmel. S.N. 1790, 2697. *I. latrator*, Oliv. Encycl. Méth. 1792, 184 (*nec* Fab.). *Ophion latro*, Gr. Nov. Act. Acad. Curios. 1818, p. 295. *Anomalon latro*, Gr. I.E. iii. 677 ; Brisch. Schr. Nat. Danz. 1880, p. 137 ; Bridg.-Fitch, Entom. 1884, p. 224 ; Thoms. O.E. xvi. 1765, ♂ ♀.

Head and thorax densely pubescent and black, with the face laterally and often centrally, or in ♂ sometimes whole face, flavous. Antennae black, with ♂ scape flavous beneath. Scutellum black. Abdomen red ; of ♀ with first segment basally infuscate, the second discally and anus from fifth black ; of ♂ with first segment nearly entirely black and remainder subinfuscate, darker apically. Legs red with all the coxae, basal half or most of hind femora and their tibial apices, black ; anterior tibiae and tarsi of ♂ flavidous. Wings slightly clouded, with stigma and tegulae rufescent. Length, 20 mm.

A variable species, with the ♂ hind femora and tibiae sometimes entirely black, at others also (var. *vicinum*, Först.) with ♂ face flavous ; or the male legs not black, though face flavous ; the ♀ var. *orbitale*, Thoms., has the basal segment entirely red, face laterally flavous, size smaller, the legs fulvous with coxae and part of hind ones black.

It is said to be a form of transition to *Erigorgus*.

Widely distributed but everywhere scarce on the Continent : Germany, Genoa, Austria, France, Sweden ; bred from pupae of *Diloba caeruleocephala* in Prussia by Brischke, and from *Perigrapha cincta* in Hungary by Mocsáry ; unknown in Belgium. It appears a somewhat southern species, hardly likely to occur with us, though twice taken by Thomson in Sweden where it must be very rare since Holmgren did not know it. Desvignes gives it as contained in his collection in 1856, and it has consequently figured in our Catalogues. Its right to inclusion must be regarded as open to doubt.

2. cerinops, Grav.

Ophion flavifrons, Gr. Ubers. zool. Syst. 1807, p. 267 ; Nov. Act. Acad. Curios. 1818, p. 295 (*nec* Fab.). *O. pubescens*, Zett. I.L. i. 393, ♂. *Anomalon cerinops*, Gr. I.E. iii. 658 ; Ratz. Ichn. d. Forst. i. 90 ; iii. 79 ; Wesm. Bul. Ac. Brux. 1849, p. 126 ; Voll. Pinac. pl. iii, fig. 7 ; Bridg.-Fitch, Entom. 1884, p. 224 ; Thoms. O.E. xvi. 1763, ♂ ♀. *A. flavifrons*, DT. Wien. Ent. Zeit. 1890, p. 140.

Head densely punctate and pubescent, subexplanate behind the eyes, black with face and clypeus flavous, and usually vertical orbits rufescent ; frons rugose, slightly impressed, with a simple central carina ; clypeus

apically subdentate in the centre. Antennae hardly longer than half body, black with scape usually flavous beneath. Thorax densely punctate and pubescent, with apically distinct notauli; metathorax coarsely rugose. Scutellum black and convex. Abdomen red with the second segment discally, and the anus broadly, black. Legs slender, the anterior fulvous; coxae and hind legs black, with apices of their femora, tibial apices and their tarsi flavous; hind tarsi subincrassate in both sexes. Wings flavescenscent, with stigma fulvous; parallel nervure emitted from about centre of brachial cell. Length, 16–20 mm.

A common species throughout all Europe in May, June and September. First bred, upon several occasions in May by Ratzeburg and Graff from *Diloba caeruleocephala*, and later by Brischke from *Calocampa vetusta* pupae, in Germany; Mocsáry is said to have bred it in Hungary from *C. exoleta*; Giraud tells us Perris raised it in France from *Orthosia gracilis*, and Gaulle records it thence from *Agrotis ripae*; to which Bridg.-Fitch add *Agrotis segetum* and a species of *Eupithecia*. It is not a generally common insect with us and I have captured but a single pair, which were sucking the stylopods of *Angelica sylvestris* at Claydon bridge—an oft-worked spot—in Suffolk on 18th September, 1898. I have seen it from Moseley near Birmingham, where Bradley took it on 11th June, 1899; and it is recorded from Sparham by Norgate and Brundall in Norfolk (Bridgman); Bickleigh on 9th July (Bignell); Lands End (Marquand); and a specimen bred by Adkin from *Heliothis dipsacea* was exhibited at Meeting of S. Lond. Ent. Soc. on 14th Dec. 1893. I have it from Chiswick (Sich), Shere (Capron), Felden in 1899, etc. (Piffard), Retford district (Pegler); Kilmore in Ireland in middle of August, 1898 (Beaumont) and Loo Bridge at the end of August, 1908 (Andrews).

3. *procerum*, Grav.

Anomalon procerum, Gr. I.E. iii. 651; Holmgr. Ofv. 1857, p. 172; Sv. Ak. Handl. 1858, p. 21; Thoms. O.E. xvi. 1763; Schm. Opusc. Ichn. p. 1477, ♀.

Head slightly constricted posteriorly, black with palpi, mandibles except their apices, clypeus and face flavous; vertical dots and external orbits rufescent; frons deplanate, rugose, with a simple central carina. Antennae hardly longer than half body, dull red with their apices infusate, the second and third joints discally piceous and the two basal flavous beneath. Thorax almost narrower than head, closely and somewhat coarsely punctate, black with sutures and metathoracic apex rufescent. Scutellum black, and distinctly carinate laterally. Abdomen red with the second segment discally, and anus from the fifth, nigrescent. Legs slender and red, coxae basally infusate, anterior tarsi and tibiae flavous; hind tarsi subincrassate and apically black, with their metatarsal base rufescent. Wings piceous-flavescenscent, with stigma and tegulae rufescent; nervellus subcentrally intercepted. Length, 18–20 mm. ♂ hitherto unknown.

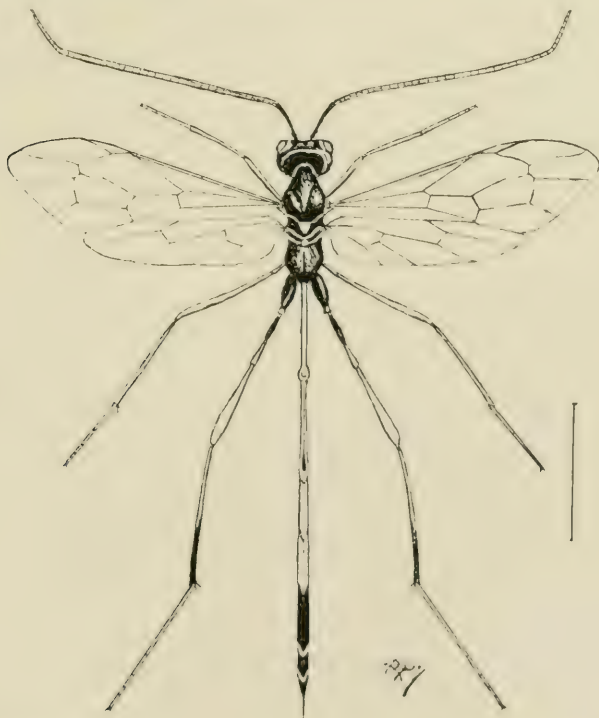
A single German ♂ in Mus. Brit., ex coll. Ruthe, agrees perfectly with the above description, excepting in its immaculate vertex and black hind coxae; the temples are broadly red, and both legs and abdomen distinctly paler than usual. The second recurrent nervure is very nearly continuous with the submarginal, thus allying the species with *Erigorgus* and *Anomalon latro*.

Very rare on the Continent and thought by Gravenhorst, who knew but two females—from Berlin and Volhynia—to possibly be no more than a variety of *A. xanthopus*. Holmgren, however, considered it distinct, and detailed two females, taken by Boheman in Sweden; Thomson simply terms it rare in central Sweden; and Schm. has never taken it, though Brischke says the female occurs in Prussia. In his "Fauna and Flora of Norfolk, part xiii., Ichneumons" (Trans. Norfolk Nat. Soc. 1894, p. 618), Bridgman has included this species with a query as having been doubtfully captured by E. A. Atmore at Kings Lynn in that county, which is our only claim to the species as British.

4. *biguttatum*, Grav.

Anomalon biguttatum, Gr. I.E. iii. 642, ♀; Ratz. Ichn. d. Forst. i. 88; Wesm. Bul. Ac. Brux. 1849, p. 125; Holmgr. Ofv. 1857, p. 170; Sv. Ak. Handl. 1858, p. 19; Kawall, Stett. Ent. Zeit. 1858, p. 68; Voll. Pinac. pl. xliii, fig. 1; Schm. Zeits. Hym.-Dip. 1901, p. 1; Opusc. Ichn. p. 1477, ♂ ♀. Var. ♀, Brisch. Schr. Nat. Ges. Danz. 1880, p. 136. *Aphanistes biguttatus*, Thoms. O.E. xvi. 1760, ♀.

Head somewhat constricted behind the eyes and black with the palpi, mandibles except apically, cheeks, clypeus, face and vertical dots flavous;



frons deplanate and rugose, with a simple central carina. Antennae three-quarters length of body, fulvous with the basal joints discally black. Thorax a little narrower than head, punctate and feebly nitidulous, with

short and sparse pubescence; black with callosity below radices and marks above hind coxae flavous or red; metathorax coarsely rugose. Scutellum convex, not laterally carinate and always (with usually the post-scutellum) bright flavous. Abdomen red with second segment discally, and anus from fifth segment, black. Legs red, with the anterior partly and all the tarsi flavous; hind tibial apices, whole of their coxae, and in ♀ base of the anterior, black; hind tarsi subincrassate. Wings distinctly flavescent, with stigma and tegulae fulvidous; nervellus subcentrally intercepted. Length, 15–20 mm.

This species forms a connecting link between the present restricted genus and *Aphanistes*, in which Thomson placed it, since, though lacking frontal horn, the mesonotum is apically depressed.

It is everywhere rare; Gravenhorst first took several females near Frankfort flying round *Pinus sylvestris* at the beginning of October; Ratzeburg, who knew both sexes, calls it a Schmarotzer der Kiefernspinner, bred from *Fidonia pinaria* by Boie; Wesmael found three Belgian specimens, but it was not rediscovered there by Tosquinet. Holmgren, who gives an excellent description of this species, in 1855 thought it very rare in Sweden, whence he also knew but three examples, of which he took a male in August and refers to a female with black postscutellum (not scutellum, *sec* Schm.); Thomson found a female in East Gothland; Brischke discovered both sexes in Prussia "aus Puppen von *Panolis piniperda* erzogen," one female with red-and-yellow marked metathorax and red hind coxae; and Dours adds that it has been raised in France from *Bombyx pini*, which host is given by Kirchner, both probably copied from Rondani. It has not hitherto been recorded from Britain, but the late Mr. Albert Piffard has kindly given me a beautiful pair, which he had correctly named and captured at Felden, near Boxmoor in Hertfordshire, about 1885.

5. *ruficorne*, Grav.

Anomalon ruficorne, Gr. I.E. iii. 655; Boie, Kröy. Tids. 1840, p. 323; Holmgr. Sv. Ak. Handl. 1858, p. 18; Bridg.-Fitch, Entom. 1884, p. 223; DT. Wien. Ent. Zeit. 1890, p. 140, ♂ ♀. *A. Wesmaeli*, Holmgr. Sv. Ak. Handl. 1854, p. 25; *lib. cit.* 1858, p. 18; Voll. Pinac. pl. iii, fig. 4, ♂ ♀. *Aphanistes ruficornis* et *Wesmaeli*, Thoms. O.E. xvi. 1762, ♂ ♀.

Head slightly constricted posteriorly, densely punctate, with short pubescence; black with the face, apices of cheeks and vertical dots flavous; vertex deeply emarginate. Antennae nearly as long as body, entirely rufescent flavous; ♂ scape flavous beneath. Thorax black and a little narrower than head; mesonotum closely punctate; metathorax reticulate-rugose and longitudinally impressed, with apex sometimes rufescent. Scutellum flatly and sublongitudinally impressed apically. Abdomen red with postpetiole partly, second segment discally and anus from the fifth or sixth segment black. Legs red with anterior partly flavidous; hind coxae basally or entirely and their tibial apices black, their tarsi flavous with metatarsal base red. Wings flavescent, with stigma and tegulae rufescent. Length, 15–20 mm.

By no means common in central and northern Europe; bred from *Callimorpha dominula* (Giraud), *Demas coryli* (Boie), *Gastropacha piniperda* (Schm.), *Sphinx pinastri* (Brisch. Schr. Nat. Ges. Danz. 1880, p. 135); and Gaulle says also from *Cosmotriche potatoaria* and *Hilophila prasinana*. This species was first described from a female and a couple of males sent

Gravenhorst by Hope from Netley; subsequently I can only find that Bignell has captured it in the Bickleigh Woods in Devon on 21st June. It seems very rare with us, and perhaps western, for I possess but two females, taken at Lynton in Devon by Stanley Edwards in 1890 and at Dulverton in Somerset in July, 1892, by Philip de la Garde.

6. *xanthopus*, Grav.

Ichneumon xanthopus, Schr. En. 1781, 370, ♂ ♀; *Ophion xanthopus*, Fab. Piez. 133 (?). *Anomalon xanthopus*, Gr. I.E. iii. 652; Boie, Stett. Ent. Zeit. 1855, p. 106; Holmgr. Sv. Ak. Handl. 1858, p. 17; Voll. Pinac. pl. iii, fig. 8; Bridg.-Fitch, Entom. 1884, p. 223, ♂ ♀. *A. gliscens*, Hartig, Jahresb. 1837, p. 260. *A. armatum*, Wesm. Bull. Ac. Brux. 1849, p. 122; Kirch. Lotos, 1856, p. 234, ♂ ♀. *Aphanistes armatus*, Thoms. O.E. xvi. 1761; Schm. Opusc. Ichn. p. 1473.

Head black with clypeus, face, apices of cheeks and vertical dots, flavous. Antennae but little longer than half body, basally black above with the black scape flavous beneath. Thorax black, with sutures and metathoracic apex sometimes red. Scutellum convex and not laterally carinate, black. Abdomen red, often discally infusate, with second segment discally and the anus black; terebra fulvous and half length of basal segment. Legs red with anterior coxae and trochanters, front tarsi and outer side of their tibiae flavidous; hind coxae mainly or entirely and their tibial apices nigrescent, tarsi flavous with metatarsal base rufescent. Wings hyaline, with nervellus intercepted far below its centre. Length, 10–19 mm.

Schm. gives the flagellum except basally as lighter or darker red, Thomson gives it as black above, mine are nearly entirely black; the former tells us the length is 15 mm., Thomson as only 10–12 mm., mine are constantly 19 mm.

It seems to be a somewhat rare species in northern and central Europe, but there is no lack of records, wherever Ichneumons have been studied; it has been bred from *Panolis piniperda* (Brischke and Ratz. Ichn. d. Forst. i. 89), from *Geometra piniaria* and on 4th December from *Halias quercana* (l.c. iii. 79); *Eugonia quercaria* and *Acronyeta cuspid* (Mocsáry), *Cucullia lychnitis* (Giraud), *Agrotis ripae* and *Mischia* (Gaulle). Hope is said to have taken a form of the female at Netley in Shropshire, but this is almost certainly not referable to the present species; Curtis (B.E. fol. 736) found it in Darenth Wood during June; Bignell captured it on 29th May in Bickleigh Woods, on 1st June at Ivybridge and on 11th May he bred it from a pupa of *Pieris daphnidia* from either the south of France (Devon. Assoc.) or from Baklar in Turkey (Entom. 1880, p. 68); Bridgman says Atmore raised it at King's Lynn from *Trachea piniperda* and I have a female bred by Barrett from the same host; Bairstow records it from Yorkshire, Sich took it at Chiswick about 1883 and Adams has given me a fine male, captured in his Lyndhurst garden at the beginning of June, 1907.

7. *bellicosum*, Wesm.

Anomalon bellicosum, Wesm. Bul. Ac. Brux. 1849, p. 124; Holmgr. Sv. Ak. Handl. 1858, p. 18; Voll. Pinac. pl. xliii, fig. 5; Bridg.-Fitch, Entom. 1884, p. 223, ♂ ♀. *Aphanistes bellicosus*, Thoms. O.E. xvi. 1761, ♂ ♀.

Head black with the palpi, mandibles, clypeus, cheeks, face and vertical dots flavous. Antennae piceous, rufescent beneath, with the scape entirely clear testaceous. Thorax black, of ♀ usually with the pleural sutures and apex, or sometimes whole, of metathorax red. Abdomen red with only the second, sixth and seventh segments discally black. Legs red, with anterior coxae and trochanters flavous; hind legs with most of coxae, trochanteral base and tibial apices black, their tarsi flavous with metatarsal base rufescent. Wings flavescent, with stigma and tegulae rufescent. Length, 13–16 mm.

It is usually somewhat smaller than *A. xanthopus*, from which it is best known by the entirely pale scape, though the scutellum is more convex and the abdominal nigrescence less extensive.

Not a common species, though widely distributed, in north and central Europe; Tosquinet says it occurs in August and September in Belgium, and Brischke bred it in Prussia from *Sphinx pinastri* as well as (*teste* Bridg.-Fitch) *Demas coryli*. It appears to be a southern species in Britain and I have not seen it from north of the Thames; Bignell took it at Ivy-bridge in Devon on 12th August; I have it singly from Shere (Capron) and Guestling (Bloomfield), though it is probably not rare in the New Forest, whence Miss Chawner has kindly sent me a series and Bradley exhibited specimens thence, named by Bignell, at a meeting of Birm. Ent. Soc. (18th May, 1896); Adams takes it in his Lyndhurst garden in July.

LABRORHYCHUS, Förster.

Först. Verh. pr. Rheinl. 1868, p. 146; *Blaptocampus*, Thoms. O.E. xvi. 1765.

Little more than a section of *Anomalon* with the anal or parallel nervure emitted at or above the centre of the brachial cell, which is itself sub-parallel-sided and not, as in that genus, distinctly explanate towards its apex. The species are more slender and, as a rule, neither so large nor so stout.

The main distinction of Thomson's genus appears to be the position of the anal nervure, which in place of being emitted from distinctly above the centre of the brachial cell as in typical *Labrorhynchus* species, is emitted from its centre; the synonymy of Wesmael's two species, here proposed, reduces Thomson's genus to little more than specific rank and as such I have considered it in the following table.

Table of Species.

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|------|----|--|------------------------|
| (2). | 1. | Anal nervure emitted from centre of brachial cell [BLAPTOCAMPUS, Thoms.] | 1. NIGRICORNIS, Wesm. |
| (1). | 2. | Anal nervure emitted distinctly above centre of brachial cell [LABRORHYCHUS, Först.] | |
| (4). | 3. | Antennae very distinctly shorter than the whole body | 2. CLANDESTINUS, Grav. |

- (3). 4. Antennae very distinctly as long as the whole body.
 (6). 5. Scape black; head somewhat explanate behind the eyes 3. *TENUICORNIS*, *Grav.*
 (5). 6. Scape fulvous; head posteriorly distinctly constricted 4. *DEBILIS*, *Wesm.*

1. *nigricornis*, *Wesm.*

Anomalon nigricorne, *Wesm.* *Bul. Ac. Brux.* 1849, p. 126; *Holmgr. Sv. Ak. Handl.* 1858, p. 22; *Kirchner, Lotos*, 1856, p. 234, fig. 10, ♂ ♀; *Blaptocampus nigricornis*, *Thoms. O.E. xvi.* 1766, ♂ ♀. Var. *Anomalon perspicuum*, *Wesm.* *Bul. Ac. Brux.* 1849, p. 127; *Holmgr. Sv. Ak. Handl.* 1858, p. 22; *Voll. Pinac. pl. xliii*, fig. 3; *Bridg.-Fitch, Entom.* 1884, p. 224, ♂ ♀; *Blaptocampus perspicuus*, *Thoms. O.E. xvi.* 1766, ♀; cf. *xix.* 2119.

Head not explanate behind the eyes, posteriorly deeply emarginate; black with mandibles except their apices, clypeus, face and apices of cheeks flavous; vertical orbits (form typ.) not pale marked; face distinctly constricted apically; clypeus apically shortly dentate. Antennae about half length of body, with scape flavous beneath and flagellum sometimes basally rufescent. Thorax black; mesonotum punctate, with notauli apically somewhat strong; pleurae centrally subglabrous; metathorax coarsely rugose, with weak central sulcus. Scutellum convex and laterally carinate. Abdomen red with second segment discally, and (form typ.) the fifth to anus both discally and laterally, black; terebral valvulae flavidous. Legs flavidous red, with the anterior paler; hind coxae and their tibial apices black, their tarsi flavous with metatarsi except apically piceous or ferrugineous. Wings slightly infumate, with stigma and tegulae flavidous. Length (British), 11-14 mm.

I consider *Anomalon perspicuum* certainly no more than a variety, since *Schm.* could find no better difference than the distinctly pale-dotted vertical orbits and immaculate red fifth segment; *Wesmael* gives no comparison.

Generally distributed on the Continent, though commoner in the north; the typical form is said to be the more frequent and is recorded by *Gaulle* to have been bred from *Dendrolimus (Bombyx) pini* in France. With us the typical form has not hitherto been anywhere noticed and it must be extremely rare, since I have seen but a single example, captured at *Guestling* in *Sussex* in 1893 by *Rev. E. N. Bloomfield, M.A.* The var. *perspicuus*, on the contrary, is a common species in Britain and my thirty exponents came from *Ivybridge* in *Devon* during *May* (*Keys*), *Lyndhurst* in early *July* (*Adams*), *Shere* (*Capron*), *Coply* in mid-*June* (*Beaumont*), *Felden* (*Piffard*), *Ashby* near *Doncaster* in *May* (*Dr. Cassal*), *Edwinstowe* in *May* (*Lady Robinson*), *Cannock Chase* in early *June* (*Tomlin*), and *Colintraive* on 24th *May* and *Cadder* on 10th *June*, 1900 (*Dalglish*). A male was "bred *June* 26th, 1905, from *Tortrix* chrysalis found on birch, *Corfe Castle, Dorset*" (*Bankes*); *Dr. Chapman* sent me a chrysalis exactly resembling this one on 22nd *June*, 1899, from which another male had just emerged; it was first found to be indigenous by *Atmore*, who raised it from *Cleora lichenaria* (*Entom.* 1883, p. 65), and subsequently from *Trachea piniperda*, at *Lynn* in *Norfolk* during *June*, 1882. The species has always occurred to me flying round young birch trees in woods at *Bentley* and *Assington* in *Suffolk*, from the middle of *May* to that of *June*, in company with *Agrypon flavicollatum*, though more rarely than that insect.

2. *clandestinus*, Grav.

Anomalon clandestinum, Gr. I.E. iii. 670; Wesm. Bul. Ac. Brux. 1849, p. 129; Holmgr. Sv. Ak. Handl. 1858, p. 26; Brisch. Schr. Nat. Ges. Danz. 1880, p. 137; Bridg.-Fitch, Entom. 1884, p. 224, ♂ ♀. *Agrypon clandestinum*, Först. Verh. pr. Rheinfl. 1860, p. 151; Thoms. O.E. xvi. 1770, ♂ ♀. *Labrorhychus clandestinus*, Schm. Opusc. Ichn. p. 1497, ♂ ♀. Var. *Anomalon affine*, Holmgr. Ofv. 1857, p. 181; Sv. Ak. Handl. 1858, p. 27, ♂ ♀.

Head and thorax shortly and diffusely grey-pubescent, finely and rugosely punctate, subnitidulous with the former somewhat the broader. Head slightly constricted posteriorly, black with mandibles except apically, clypeus, cheeks and face flavous. Antennae but little shorter than body with the scape flavous, and flagellum towards its apex rufescent, beneath. Thorax black, with flavous radical callosities; notauli distinct; pleurae centrally glabrous and nitidulous; metathorax coarsely rugose, with traces of smooth basal areae. Scutellum deplanate and rugose. Abdomen thrice length of head and thorax, fulvous with the first segment basally and remainder more or less discally piceous. Legs red, with anterior coxae and trochanters flavous and tibiae basally subnigrescent, paler in ♂; hind legs incrassate with basal and apical trochanteral joints of equal length, and metatarsus as long as remaining joints united; their coxae and trochanters mainly, femoral base, tibial apices and their tarsi, infusate. Wings hardly clouded; lower basal nervure postfurcal; parallel nervure emitted far above centre of brachial cell; nervellus weakly intercepted below its centre. Length, 9–13 mm.

The var. *affinis* is somewhat larger with the hind coxae red; it is rare with us and I have only a pair, taken by Capron at Shere in Surrey and by myself in the Bentley Woods on 11th May, 1898, on birch.

Locally abundant abroad, occurring from Sweden to an altitude of two thousand feet in the Pyrenees, where many have been bred from chrysalids of *Eupithecia veretraria*, often after two years in pupae; Goosens raised it from the same host nearly 40 years ago in Bavaria. In Prussia, Brischke frequently bred it from *Emmelesia alchemillata*, *Eupithecia lariciata*, *E. actacata*, *Oenectra pilleriana*, *Hyponomeuta evonymella* and *Cerostoma radiatella*. In Britain it is common if not abundant, rarely taken in the field though constantly bred by Lepidopterists from *Hemitha thymiararia* on 12th July by Bignell and *Eupithecia linariata* by Barrett (Entom. 1881, p. 139), *E. absynthiata* by Raynor, *E. castigata* on 14th May and *Cerostoma costella* on 20th July by Bignell (*l.c.* 1883, p. 65), *Hypsipetes impluviata* and *Eupithecia pumilata* (*l.c.* 1884, p. 226); and at Lynn by Atmore from *E. valerianata* (Bridgman). Christy gave me four males raised from New Forest *Nemoria viridata* on 30th June, 1899; Ash a forced and weak female from *Eupithecia albipunctata*, Hw., taken in Bishops Wood near Selby on 1st Jan., 1902; Porritt sent another, bred in April, 1896, from an unknown larva at York; and Slater raised it on 12th Oct., 1907, at Withycombe near Taunton from *Eupithecia coronata*. Single examples have occurred at Felden in Herts, at Shere and Abinger Hammer in Surrey; and I beat a male from birch at the end of August, 1902, in Tuddenham Fen.

3. *tenuicornis*. Grav.

Anomalon tenuicorne, Gr. I.E. iii. 671; Wesm. Bul. Ac. Brux. 1849, p. 134; Holmgr. Sv. Ak. Handl. 1858, p. 28; Brisch. Schr. Nat. Ges. Danz. 1880, p. 137; Bridg.-Fitch, Entom. 1884, p. 225, ♂ ♀. *Agrypon tenuicorne*, Först. Verh. pr. Rheinl. 1860, p. 152; Thoms. O.E. xvi. 1769. *Labrorhynchus tenuicornis*, Schm. Opusc. Ichn. p. 1494.

Head pubescent and posteriorly explanate, black with clypeus, face and the ♀ cheeks flavous; vertex deeply emarginate; face punctate and distinctly constricted apically; temples rufescent and closely punctate; cheeks with lamellar margins. Antennae always fully as long as, or slightly longer than, the body; black with scape flavous, and flagellum basally rufescent, beneath. Thorax pubescent and black, mesonotum subdiffusely punctate, with somewhat obsolete notauli; metathorax deplanate and rugose. Scutellum laterally carinate. Abdomen red, discally and apically nigrescent. Legs fulvous and slender with the front coxae transcarinate, hind tarsi not explanate and anterior coxae of only ♂ flavous; hind coxae and trochanters, in the smaller specimens, black; hind femora rarely basally piceous, their tibiae usually not apically infusate. Wings slightly infumate, with stigma rufescent and tegulae fulvous; nervellus weakly intercepted below its centre. Length, 9–13½ (French—16) mm.

Known by the remarkable length of the antennae and only to be mixed with the next species.

Abundant throughout Europe. Bred on the Continent from *Hyponomeuta padella*, *H. malinella* and *H. evonymella* (Dours); from pupae of *Cymatophora* (Or, and—teste Bridg.-Fitch—*Anarta myrtilli* (Brischke); *Thais polyxena* from (?) Greece (Bignell, E.M.M. 1887, p. 140); *Doritis Apollinus*, “chenilles d'*Euchelia jacobaeae*, prises au bord de la mer, à Cancale, au mois d'août” and from *Thais medesicaste* (Giraud); Dr. Chapman has given me twenty-two of the maximum size bred by him from the last host at Digne in June, 1908. With us it seems confined entirely to woods; some co-types were taken by Hope about Netley; it was evidently well known to Curtis, who found males in May and females in July on oaks in Coombe Wood, Wimbledon; I have taken it in Parkhurst Forest, Isle of Wight; at Wilverley, Knight Wood and on *Mentha hirsuta* at Philips Hill in the New Forest, where it is common (Miss Chawner, Thornley, Adams, &c.); Guestling (Bloomfield), Darent Wood (Andrews), Shere (Capron), Oxshott (Beaumont). But there are no records north of Suffolk, where it is common in woods at Bentley and Assington and Wherstead, flying round birch and poplar from 21st May to 11th July; once I swept it from *Mercurialis perennis* and once took a curiously belated female on 6th September, 1895. It has been reared with us from *Selenia lunaria* by Elisha (Entom. 1883, p. 65); *Dianthaccia capsicola* by Bignell (l.c. 1881, p. 139), and the same observer bred it on 25th May from *Anisophlyx aescularia* in South Devon; Bridgman adds that it has been found to attack *Gelechia nacriferella* at Worthing and *Phycis roborella* at Kings Lynn. South gave me a male which emerged on 22nd August, 1903, from *Closteria pigra* at Oxshott and Charbonnier another which emerged on 1st April, 1907, from a *Tortrix* chrysalis, spun up in an oak leaf at Bristol.

4. *debilis*, Wesm.

Therion gracilipes, Curt. B.E. fol. 736, ♂; cf. Bridg.-Fitch, Entom. 1884, p. 225 (?). *Anomalon debile*, Wesm. Bul. Ac. Brux. 1849, p. 133, ♂ ?; cf. Krieger, Zeits. Hym.-Dip. 1904, p. 173. *Labrorhynchus debilis*, Schm. Opusc. Ichtn. p. 1495, ♂ ♀. (?) *L. variegatus*, Szépl. Term. Füz. 1899, p. 216, ♀.

Head black, with the face and cheeks flavous; temples immaculate black. Antennae exactly as long as body in ♀, not longer in ♂, with flagellum rufescent before its base; scape bright red, with postannellus and flagellar base black. Abdomen red with second segment alone disically piceous, rarely with anus also nigrescent; terebral valvulae piceous. Legs red, with the anterior coxae and trochanters of both sexes flavous; hind legs with trochanters, tibial apices and those of all the tarsal joints nigrescent. Length, 12 (abroad -16 mm.).

Extremely like *L. tenuicornis*, but with the head distinctly constricted posteriorly, the scape fulvous above, the antennae somewhat shorter and anterior legs of ♀ basally flavous; Wesmael says the scutellum is rarely laterally red.

Not uncommon in Belgium (Wesmael), in June and August (Tosquinet); France (Gaulle); and Germany (Krieger). It has not been mentioned from Britain, but I captured a single undoubted female on the flowers of *Foeniculum vulgare* on the morning of 3rd September, 1899, at Alderton on the Suffolk coast; it was the only Anomalid seen. I place Curtis' male tentatively here, since it is almost certainly this or the last species, which latter he knew; he says the antennae are very long and hind tarsi not explanate, the anus is black and the length 11 mm.; he gives no locality and his description is inadequate.

AGRYPON, Förster.

Först. Verh. pr. Rheinl. 1860, p. 151.

This genus is at once recognised by the total lack of any nervure emitted by the nervellus and in this character agrees with the same author's genus *Atometus*, which was regarded as distinct upon the feature of the anal or parallel nervure being emitted so high from the brachial cell as to be subcontinuous with the median. This hardly constitutes generic rank, however, and I have treated both under the present name. How far *Agrypnon* itself will stand the test of anything approaching a thorough investigation it is not yet easy to say; I myself lean to the assumption that it is totally non-existent, which is to say that the whole of the species here grouped on account of the deficient nervure of the hind wing are nothing but somewhat weakly developed individuals of species already treated of under the preceding genera. Thus both *Agrypnon varitarsum* and *A. nigripes* are quite certainly only weak *Labrorhynchus tenuicornis*; and the distinctions between *L. nigricornis* and *A. flaveolatum*, with which it so constantly occurs, are subtle.

Table of Species.

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| (20). | 1. Anal (parallel) nervure not continuous with the median. | |
| (5). | 2. Face not entirely flavous. | |
| (4). | 3. Abdomen centrally clear red; head immaculate black | I. TENUITARSUM, Grav. |

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| (3). | 4. | Abdomen discally black; face at least laterally pale | 2. ANOMELAS, <i>Grav.</i> |
| (2). | 5. | Face entirely flavous. | |
| (9). | 6. | Antennae fully as long as the whole body. | |
| (8). | 7. | First flagellar joint double length of second; hind legs red | 3. VARIITARSUM, <i>Grav.</i> |
| (7). | 8. | First flagellar joint one-fourth longer than second; legs black | 4. NIGRIPES, <i>Bridg.</i> |
| (6). | 9. | Antennae very little longer than half the body. | |
| (11). | 10. | Pro- and meso-sternum broadly flavous | 5. INTERRUPTUM, <i>Desv.</i> |
| (10). | 11. | Sternum black, or rarely red. | |
| (15). | 12. | Scutellum deplanate and laterally strongly elevated. | |
| (14). | 13. | Mesonotum nitidulous; parallel nervure central; vertex black | 6. CANALICULATUM, <i>Hlg.</i> |
| (15). | 14. | Mesonotum dull, rugose; parallel nervure above centre; vertex pale-dotted | 7. MINUTUM, <i>Bridg.</i> |
| (12). | 15. | Scutellum subconvex and not laterally elevated. | |
| (19). | 16. | Mesonotum nitidulous and finely punctate. | |
| (18). | 17. | Hind legs rufescent; head posteriorly explanate | 8. FLAVEOLATUM, <i>Grav.</i> |
| (17). | 18. | Hind legs mainly piceous; head posteriorly narrower | 9. SEPTENTRIONALE, <i>Hlg.</i> |
| (16). | 19. | Mesonotum dull and rugulose punctate | 10. ANXIUM, <i>Wesm.</i> |
| (1). | 20. | Anal nervure continuous with the median [ATROMETUS, Först.]. | |
| (24). | 21. | Antennae nearly length of body; thorax red marked. | |
| (23). | 22. | Hind coxae red; head mainly concolorous | 11. ARQUATUM, <i>Grav.</i> |
| (22). | 23. | Hind coxae black; head mainly concolorous | 12. INSIGNIS, <i>Först.</i> |
| (21). | 24. | Antennae hardly longer than half body; thorax black | 13. GENICULATUM, <i>Hlmg.</i> |

1. tenuitarsum, *Grav.*

Anomalon tenuitarsum, Gr. I.E. iii. 683; Bridg.-Fitch, Entom. 1884, p. 224, ♂ ♀. *Therion tenuitarsum*, Curt. B.E. 1839, fol. 736. *Agrypon tenuitarsum*, Schm. Zeits. Hym.-Dip. 1903, p. 174.

Head entirely black; antennae a little shorter than half body. Abdomen red with base of first, disc in ♀ and base in ♂ of second segment, and anus from the fifth, black. Legs black with the front ones except coxae and trochanters and femoral base, and the intermediate tibiae and femoral apices, flavidous; tarsi not explanate. Wings slightly infumate with the tegulae and stigma nigrescent. Length, 12-15 mm.

The only species of the present genus with entirely black face.

Very little is known of this species; Gravenhorst received a pair from Vollhynia; Curtis thought "it was this which Mr. Dale bred from pupae of *Episema caeruleocephala*," but he was doubtless mistaken; Gaulle records

it from France, and quotes Bridg.-Fitch, who tell us (*loc. cit.* p. 226) that Weston bred it from both *Zygacna filipendulæ* and *Z. loniceræ* in England. I have seen nothing like it.

2. *anomelas*, Grav.

Anomalon anomelas, Gr. I.E. iii. 680; Bridg.-Fitch, Entom. 1884, p. 224, ♀. *A. trochanteratum*, Holmgr. Sv. Ak. Handl. 1858, p. 25, ♂; Krieger, Zeits. Hym.-Dip. 1904, p. 174. *Agrypon anomelas*, Schm. Opusc. Ichn. 1510, ♂ ♀.

Head black with only the sides, or also a small central mark, flavous; temples immaculate black. Antennæ with both scape and flagellum rufescent beneath. Thorax black with the mesonotum punctate and somewhat nitidulous; scutellum convex and rugose. Abdomen red with the second segment discally, the second to fourth at least discally, the anus from base of the fifth, and in ♂ nearly whole of first, segment black. Legs stout and red with the coxæ and trochanters black, as also are the hind tibiae except basally with their femora, and often the anterior, basally; hind tarsi spatuliform. Wings distinctly short. Length, 12-15 mm.

Introduced as British by Bridgman (Trans. Ent. Soc. 1884, p. 425) on the strength of specimens from Colchester; and subsequently (Trans. Norf. Soc. 1894, p. 618) he queries it as bred from *Retinia turionoma* by Atmore at Kings Lynn in Norfolk. It is said to occur in north and central Europe, but I fancy very few specimens are known; and I possess but a single male, which I found near Ipswich in 1894. Probably neither Gravenhorst's variety, nor that referred to by Brischke (Schr. Nat. Ges. Danz. 1882, p. 137) belong here.

3. *variitarsum*, Wesm.

Anomalon variitarsum, Wesm. Bul. Ac. Brux. 1849, p. 131, ♂ ♀; Holmgr. Sv. Ak. Handl. 1858, p. 19; Ofv. 1857, p. 185, ♂ ♀. *Agrypon varitarsis*, Thoms. O.E. xvi. 1769. *A. variitarsum*, Schm. Opusc. Ichn. p. 1512. Var. *Labrorhynchus*, *ruficoxis*, Szépl. Term. Füz. 1899, p. 218, ♂

This species differs from my description of *Labrorhynchus tenuicornis* only in having the head not posteriorly explanate but roundly constricted; the vertical dots (except in var. *ruficoxis*) pale, the temples usually though not always with no rufescent mark; basal flagellar joint about double length of second; mesonotum more finely and diffusely punctate, with stronger notauli and radical callosities pale; scutellum laterally and metathoracic apex rufescent; wings subhyaline with nervellus distinctly geniculate below centre, though not at all intercepted.

Not a common form on the Continent; Belgium in June and September, infrequent in Sweden in May, and France. I find no mention of it as British and possess but a single male taken on birch bushes, along with both sexes of *L. tenuicornis*, in the Bentley Woods on 21st May, 1902.

4. *nigripes*, Bridg.

Anomalon nigripes, Bridg. E.M.M. xxiv. 1887, p. 150, ♂.

This male differs from that of the last species solely in having the basal flagellar joint hardly a quarter longer than the second, in its mainly

nigrescent hind legs and in having the nervellus quite straight, not at all geniculate. Length, 10-11 mm. ♀ unknown.

Both this and the last are quite certainly nothing but weakly developed forms of *Labrorhynchus tenuicornis*.

The two males described by Bridgman were bred from mixed Lepidopterous larvae found by Fletcher feeding on sloe in Abbots Wood near Polegate in Sussex. I captured a single male on 29th May, 1902, in the Bentley Woods, Suffolk, along with the last species.

5. *interruptum*, Desv.

Anomalon interruptum, Desv. Cat. 1856, 106; Bridg.-Fitch, Entom. 1884, p. 224, ♀.

Head with the face alone flavous. Antennae half length of body, ferrugineous above and castaneous beneath, with the scape basally black-ringed. Thorax with the sternum flavous before the front coxae and between the intermediate. Abdomen somewhat broad and black, with the three apically rufescent basal segments subcylindrical; terebra shortly exserted. Legs fulvous, with the anterior coxae and trochanters flavous; hind legs castaneous, with trochanters and their tibial apices black. Wings somewhat short with the costa, stigma and tegulae fulvous. Length, 14 mm.

It is said to be a male, though allowed an aculeus by its author; and is placed among *Agrypon* by Bridg.-Fitch, who do not seem to know it, though they ascribe it the length quoted above. I have not examined the type "in Mr. Desvignes' Collection."*

6. *canaliculatum*, Holmgr.

Anomalon canaliculatum, Holmgr. Sv. Ak. Handl. 1858, p. 23, ♂ ♀ (nec Ratz.).

Head with the face, clypeus, palpi, mandibles except apically, and apices of cheeks, but not the vertex flavous; temples not broad, frons rugose and face apically constricted. Antennae a little longer than half body. Thorax immaculate, with notauli distinct and mesonotum subnitidulous; scutellum deplanate, apically subexcavate and laterally strongly elevated, especially beyond its centre. Abdomen red with its disc, except basal segment, black. Legs red, with the tarsi and ♂ front legs flavous, hind tibiae apically black, as are the ♂ hind coxae and trochanters; hind tarsi subincrassate. Wings with parallel nervure emitted from centre of

* Very little seems to be remembered by the present generation of Thomas Desvignes, and his work in general has been largely supplemented. He was a great friend of the Rev. T. A. Marshall and, also, of Fred. Smith; he frequently worked at the British Museum, the Natural History department of which was then at Bloomsbury, though I think he was never officially connected with it. His Catalogue of the British Ichneumonidae in the British Museum fills a broad gap between the lists of Stephens and Marshall, though I fear (as was in those days inevitable) many of his determinations were inaccurate and that we have not yet shaken off all the species he erroneously considered to be British, especially among the larger Ichneumoninae. He was an original M.E.S. (1833) and must consequently have been of advanced age when he died at Woodford in Essex on 11th May, 1868. The President remarked in his Address before the Entomological Society in January, 1869, that he was "one of what may be termed the old school of British Entomologists and was chiefly known for his great knowledge of the British Ichneumonidae." His Catalogue evidently brought him notoriety, if not celebrity, for we read of a meeting of the Entomological Society in the old Bedford Square days (Ent. Weekly Intelligencer, 5th July, 1856) "Who is that gentleman sitting with his back to the window who might pass for the effigy at a tobaccoist's shop, he is so continually taking snuff?" "Oh! that is Mr. Desvignes, so deep in the literature of the Ichneumonidae: they say he has so much snuff in his insect drawers that it drives away all the mites."

brachial cell; nervellus weakly intercepted far below its centre; stigma and tegulae flavidous. Length, 12-14 mm.

This species is now usually relegated to the genus *Baplocampus*, on account of the slight interception of the nervellus, which, together with the sulcate and laterally elevated scutellum, will at once distinguish it here. Its synonymy has become somewhat involved, but Holmgren's is doubtless the species recorded as British by Marshall, though that with pale vertical marks, bred by Brischke from *Hylophila prasinana* and so small a host as *Hyponomeuta evonymella*, is probably *B. perspicuus*, Wesm., since that given at Entom. 1880, p. 88 (now in my collection) from Shere in Surrey by Capron certainly is. Possibly our other records of it from *Paedisca sordidana* (Entom. 1881, p. 139) and *Steganoptycha rufimitana* (Entom. 1883, p. 65) should also go, with Ratzeburg's rearing from *Eidonia pinaria*, under that species. I possess but three British examples from London (Clarke), Gomshall near Guildford in August, 1899 (E. A. Butler) and a male bred on 8th May, 1909, at Poole from a pupa of *Cidaria* sp., from Berewood Forest in Dorset (W. P. Curtis). Col. Nurse bred a couple of males in west Suffolk early in May, 1911.

7. *minutum*, Bridg.

Anomalon minutum, Bridg. Trans. Ent. Soc. 1884, p. 425, ♂ ♀. *Trichomma minutum*, Schm. Opusc. Ichn. p. 1469.

Head very coarsely punctate, a little broader than thorax and not at all narrowed behind the entirely glabrous eyes, with the face, mouth, apices of cheeks and the vertical dots flavous; frons distinctly carinate centrally; face finely punctate throughout and nitidulous, centrally elevated, coarsely and isolatedly punctate basally, constricted towards its apex; clypeus obsoletely discreted and apically rounded; upper mandibular tooth but slightly the longer. Antennae filiform and hardly two-thirds length of body, with their underside rufescent. Thorax evenly and coarsely rugose throughout with elongate but very obsolete notauli; metathorax dull and evenly rugose, with no areae. Scutellum rugose, deplanate and black, with sides elevated. Abdomen red, slender and elongate with all the segments discally, and anus laterally, infusate; first and second segments linear and of equal length, with the former somewhat longer than the red terebra and its spiracles slightly protuberant; remaining segments compressed. Legs slender and red, with ♂ front coxae and trochanters sometimes flavous; hind coxae black or red, with apices of their tarsi and tibiae and usually part of their trochanters infusate; hind tarsi slightly incrassate, with their basal joint four times longer than broad. Wings basally flavidous, with stigma piceous; first recurrent nervure emitted from median before centre of cubital cell; parallel nervure emitted far above centre of brachial cell; second recurrent not continuous with submarginal; nervellus not intercepted. Length, $4\frac{1}{2}$ - $6\frac{1}{2}$ mm.

Bridgman at first thought it a connecting link between *Trichomma* and *Anomalon*, but he himself (Entom. 1884, p. 224) places it in *Agrypon*, though Schm. was doubtless justified, on the score of convenience, in retaining it in the former genus, which Krieger considered correct in 1904. I have been enabled to examine the type of this species in the Norwich Castle Museum (March, 1913) and find it a typical *Agrypon* with entirely glabrous eyes, the scutellum deplanate and laterally elevated with no

apical emargination; it is very like *A. canaliculatum*, Holmgr., but with pale vertical dots, rugose mesonotum and the parallel nervure emitted much higher. The above description is drawn from the type specimen.

The typical specimens were "bred by Mr. W. H. B. Fletcher from *Chrysocoris festaliella* taken in the New Forest." I have seen no other Anomalid so small, and it is quite unknown in the palaearctic fauna abroad. It superficially differs little from my dark *T. enecator* from the same locality.

8. *flaveolatum*, Grav.

Ichneumon auricapillus, Gmel. S.N. 1790, 2699 (?). *Ophion flaveolatum*, Gr. Ubers. Zool. Syst. 1807, p. 268. *Anomalon flaveolatum*, Gr. I.E. iii. 664; Boie, Wieg. Arch. 1835, p. 44, ♂ ♀; Audouin, Hist. Ins. Nuis. 1842, 181, pl. xvi, fig. 4; Ratz. Ichn. d. Forst. i. 90; ii. 79; iii. 79; Holmgr. Sv. Ak. Handl. 1858, p. 25; Ruthe, Stett. Ent. Zeit. 1859, p. 378; Brisch. Schr. Nat. Ges. Danz. 1880, p. 137; Bridg.-Fitch, Entom. 1884, p. 224, ♂ ♀. *Agrypon flaveolatum*, Först. Verh. pr. Rheinl. 1860, p. 152; Thoms. O.E. xvi. 1771; Schm. Opusc. Ichn. p. 1513, ♂ ♀.

Head intumescent and distinctly explanate behind the eyes, with vertex deeply emarginate, frons rugose and somewhat even with the central carina obsolete, face white-pubescent, cheeks broad and clypeus distinctly dentate apically; black with mandibles except apically, cheeks, face and vertical dots flavous; temples usually mainly fulvous. Antennae but little longer than half body; rufescent, at least beneath, with underside of scape flavous and basal flagellar joints black. Thorax black with pleural sutures and metathoracic apex usually rufescent; mesonotum finely punctate, nitidulous, with apically distinct notauli; pleurae shining and centrally very sparsely punctate; metathorax rugose. Scutellum deplanate and not laterally carinate. Abdomen red with the second segment, sometimes also the third to fifth, discally piceous; anus mainly black from the sixth. Legs slender and red with front coxae and part of the black hind trochanters, or in ♂ mainly flavous; hind legs with the trochanteral joints of equal length and the tarsi, especially in ♂, distinctly explanate; hind tibiae apically infusate, their tarsi flavous with most of metatarsus red. Wings distinctly flavescent, with stigma and tegulae fulvidous. Length, 9-11 (abroad -14) mm.

The thorax is very rarely discally and laterally rufescent.

One of the commonest of all Anomalides throughout the whole of Europe, from May to August, in woods and less frequently meadows. It was first incorrectly recorded by Boie (*l.c.*) from pupae of *Noctua Batis*. Bred from *Tortrix heparana* (Ratz. ii) and by Brischke from *Earias chlorana* on 6th May, 1849 (*l.c.* iii); from pupae of *E. prasinana*, *Hybernia defoliaria* and *Eupithecia alectata* (Brischke); from *Thyatira batis*—*nee* Boie, *teste* Ratz.—and *Hyponomeuta cognatella* (Giraud); and *Acrobasis consociella* (Dours). It doubtless abounds in every oak wood from Lands End and Dover to Suffolk during the last half of May, since I believe it to be the parasite *par excellence* of the ubiquitous Winter Moth; but further north it would appear to be extremely rare, and we have no reliable records beyond Cheshire. Hope found co-types at Netley; Curtis mentions its occurrence in the middle of June in Yorkshire and during August in the Isle of Arran. Lands End (Marquand), Botolphclaydon (Marshall), Shaugh Bridge in May and Bickleigh in August (Bignell); New Forest at Lyndhurst (Adams), flying about white poplar in Matley Bog at 11 a.m. in middle of June (Morley) and bred thence in March (Image); Hastings

(Esam), Guestling (Bloomfield), common at Shere (Capron), Greenings (W. Saunders), Felden as early as 9th May (Piffard), Tarrington in Hereford (Yerbury), Painswick in Glos. (Watkins), Sherwood (W. Ellis), and Cannock Chase (Tomlin). In Norfolk, Bridgman says Atmore found it at Kings Lynn, but he does not appear to have taken it himself; it is, however, not rare, since Elliott and I swept several from reeds and rank herbage in the Broads at Surlingham, Hickling and Wroxham in June, 1901.

It is one of the commonest of all Ichneumonidae, as regards the number of individuals, in all our Suffolk woods, more especially at Assington Thicks, Brandon, Bentley Woods, Orwell Park and Staverton. I have annually noticed these insects to be extremely abundant, flying and hovering round *all* the oak bushes, doubtless also the higher trees, searching for larvae; and, though I have never witnessed oviposition, I have seen them make feints at attacking young caterpillars that I believe to be those of *Cheimatobia brumata*, invariably equally abundant at the time that the parasites fly, always slowly with elevated abdomen and pendent legs, like a duck. They are about only from 16th May to 21st June in my experience—which renders one chary of August records. Tuck has found it at Tostock and Bungay, Chitty at Foxhall and Beaumont at Bentley in Suffolk, where in meadows it has occurred to me at Lavenham, Wherstead, Nutford, Reydon marshes, Tuddenham Fen and once flying round a rose bush here at Monks Soham, where my suspicions of its extremely beneficial parasitism were strengthened by seeing on 3rd June, 1908, a female poking its antennae and head between two elm leaves concealing a larva, certainly of *C. brumata*, which it closely investigated. And they were confirmed by Lyle, who actually reared this species from *C. brumata* at Brockenhurst in March, 1911; the same excellent observer has noted that it is strongly attracted by the flowers of Wood Spurge in the middle of May and has bred it in the Forest also from pupae of *Cerostoma radiatella*. Slater sent me a female bred at Withycombe in Somerset, with some little doubt, from *C. brumata* on 23rd Feb., 1908; Banks raised it at the end of May, 1905, from a pupa of *Eupithecia trisignaria*, HS., at York; and Barrett has given it me from both *E. valerianata* and *Tortrix* *sp.* It had previously been noted in Britain to attack *E. pumilata* and *Hypsipetes impluviata* by Raynor (Entom. 1884, p. 67), *Thecla betulae* by Bignell and *Notodonta dromedarius* by Marshall (*l.c.* 226), *Taeniocampa miniosa* on 14th March in south Devon (Bignell), *Bryophila perla* by W. Fletcher and *Brephos notha* (Bridgman). Unlike any other Ichneumonid of my acquaintance, this is most ferocious and, when placed in a tube, will bite and mangle any other insects contained with it; in a small tube it will live six or seven days.

9. septentrionale, Holmgr.

Anomalon septentrionale, Holmgr. Ofv. 1857, p. 179; Sv. Ak. Handl. 1858, p. 27; Bridg.-Fitch, Entom. 1884, p. 224, ♂ ♀. *A. flavcolatum*, var., Brisch. Schr. Nat. Ges. Danz. 1882, p. 137. *Agrypon flavcolatus*, var., Thoms. O.E. 1771.

Head hardly broadened behind and black with the mouth, clypeus, orbits, genal apices, face and vertical marks on either side, flavous. Antennae shorter than body, with scape flavous beneath. Thorax black, with radical callosities rufescent and the mesothorax somewhat strongly punctate. Abdomen with two basal segments red with the second dis-

cally darker, the third and fourth nigrescent with their sides rufescent, and the remainder black. Legs rufescent flavous with anterior coxae and trochanters flavous; hind coxae, trochanters and apical half of tibiae black, femora except apically nigrescent, their tarsi flavous with the onychii nigrescent and metatarsus except apically piceous. Length, 10-12 mm.

Both Brischke, who raised it from *Eupithecia actaeata* and Thomson consider *A. septentrionale* to be a mere variety of *A. flaveolatum* with "Hinterschenkel, erstes Glied der Hintertarsen fast ganz und Segmente 1 und 2 schwarz. Bei den ♀ die gelbrothen Schläfen mit den gelben Wangen verbunden." Schm. considers it a good species and commoner in the north of Europe. It was introduced as British by Bridgman (Trans. Ent. Soc. 1881, p. 157) on the strength of specimens bred by Bairstow, probably in Yorkshire, and sent by Capron, in whose collection I possess a long series of what he labelled as this species. But these I have no hesitation in ascribing to a weak form of *Labrorhynchus clandestinus*, since the nervellus is traceable in them all. Raynor is reputed (Entom. 1883, p. 65; given without the query at *lib. cit.* 1884, p. 227) to have bred it from *Pocilocampa populi*.

10. *anxium*, Wesm.

Anomalon anxium, Wesm. Bul. Ac. Brux. 1849, p. 130, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 137, ♂; Bridg.-Fitch, Entom. 1884, p. 224, ♂ ♀. *Agrypon anxium*, Thoms. O.E. xvi. 1770, ♀; cf. xix. 2120; Schm. Opusc. Ichn. p. 1515, ♂ ♀. (?) *A. rugifer*, Thoms. O.E. xix. 2119, ♂ ♀.

Head black with the face, cheeks and vertical dots flavous; temples of ♀ rufescent. Antennae hardly longer than half body. Thorax black; scutellum subconvex with lateral carinae not prominent. Abdomen red with at least the second segment discally, and the anus, infusate. Anterior legs red, basally flavous; front coxae transcarinate; hind coxae, trochanters, femoral base and tibial apices black; hind trochanters subequal in length, tibiae basally constricted and tarsi but slightly explanate. Length, 9-12 mm.

Very like *A. flaveolatum*, but with the mesonotum dull and rugosely punctate, and the front coxae carinate. In my males the hind tarsi are no less explanate, though the abdomen is discally darker and the wings subhyaline in both sexes.

A rare or overlooked species. Belgium (8 ♀ ♀ in coll. Wesm.), during June and July (Tosquinet); Königsberg (Brischke); from two or three Swedish localities (Thomson); and France (Gaulle). Vollenhoven says De Graaf bred it from *Teras hastiana* and Bridgman introduces it as British (Trans. Ent. Soc. 1884, p. 425) on the strength of a male, raised by Elisha from *Eupoecilia udana* on 31st of the preceding April. I have three examples taken, along with *A. flaveolatum*, in the Bentley Woods and Assington Thicks on 21st May, 1899, and a female with immaculate temples from Dr. Capron's Surrey collection. Clutten sent me females bred at Burnley from *Taeniocampa instabilis* in August, 1899, and three parasitised pupae of *Epanda viminalis* from Doncaster also in August, 1899, from which a ♀ of the present species emerged on 3rd of the following May; it had formed no cocoon, but came direct from the host-chrysalis. Col. Yerbury took females at Ledbury and Tarrington in Hereford during August, 1902.

11. *arquatum*, Grav.

Anomalon arquatum, Gr. I.E. iii. 668; Bridg.-Fitch, Entom. 1884, p. 224, ♂ ♀. *Atrometus arquatus*, Schm. Opusc. Ichn. 1518, ♂ ♀.

Head red with the face flavous, the occiput and vertex black. Antennae with the scape rufescent above and flavous beneath; the flagellum dull red, its two basal joints discally black, and the apical ones mainly nigrescent. Thorax dull red, or in ♂ mainly black; prothoracic marks, scutellar region, a longitudinal metathoracic vitta, with pleurae mainly, black. Abdomen rufescent with fifth to seventh ♀ segments discally and laterally infusate. Legs red with the anterior flavidous; hind tibiae apically piceous, their tarsi flavous with metatarsus dull red. Wings slightly clouded with the tegulae and stigma testaceous. Length, 12–15 mm.

It is said to have the conformation of *Labrorhynchus tenuicornis*, but Gravenhorst says the antennae are a little stouter. Records appear very scanty and Schm. mentions it only from central Europe, though it is included as French by Gaulle. Bridgman introduced it as British (Trans. Ent. Soc. 1884, p. 425), since Bignell had sent him "this pretty species" bred from *Taeniocampa gothica*; but no one else has met with it and I possess but a single female, which I place here with some doubt; this was bred from a chrysalis of *Epunda viminalis*, found at Doncaster, of which six were kindly sent me on 8th August, 1900, and this alone emerged on the 3rd of the following May; the thorax is but sparsely red-marked.

12. *insignis*, Först.

Atrometus insignis, Först. Verh. pr. Rheinl. 1878, p. 77, ♂ ♀; Schm. Opusc. Ichn. 1519. *Anomalon trachynotus*, Brauns, Term. Füz. 1895, p. 42, ♀.

Head posteriorly explanate; cheeks and the rufescent temples nitidulous, face apically strongly constricted with mandibles partly rufescent and clypeus centrally acuminate. Antennae about as long as body and rufescent beneath. Thorax black with prothoracic marks, the rugosely punctate mesonotum laterally, and sometimes scutellum, rufescent; notauli wanting; metathorax rugulose. Legs red with anterior coxae and trochanters black, as are whole of hind legs except the red metatarsus. Wings with stigma piceous, tegulae red, and the parallel nervure subcontinuous with median. Length, 12–13 mm.

Förster described it from southern France and Brauns from Hungary, where it was bred from *Zygaena laeta* by Mocsáry, to which Schm. adds *Z. carniolica*. I possess a couple of males raised by Barrett from *Psyche villosella* and a female bred from a sawfly-feeding *Tortrix* on 24th July, 1909, at Studland in Dorset by Haines, upon the strength of which I consider this species to be British.

13. *geniculatum*, Holmgr.

Anomalon geniculatum, Holmgr. Ofv. 1857, p. 182; Sv. Ak. Handl. 1858, p. 27; Brisch. Schr. Nat. Ges. Danz. 1880, p. 137; Bridg.-Fitch, Entom. 1884, p. 224, ♂ ♀. *Atrometus geniculatus*, Thoms. O.E. xvi. 1768, ♂ ♀.

Head posteriorly explanate, with the apically strongly constricted face, the clypeus, mandibles except apically, apices of cheeks and outer orbits, flavous; occiput deeply emarginate, frons rugose with no central carina,

and centre of clypeus shortly produced. Antennae about half length of body, nigrescent with scape flavidous beneath. Thorax black with only a flavous callosity before radices; mesonotum strongly punctate with the notauli indistinct; metathorax coarsely rugose, with no lateral basal areae. Scutellum deplanate and laterally elevated. Abdomen piceous with the first segment, except sometimes basally, red and the second nearly entirely dull rufescent. Legs red with the anterior subflavidous; hind coxae, base of trochanters and of femora, apices of the latter and of the tibiae, with the tarsi, nigrescent; basal trochanteral joint the longer; hind tibiae stout and basally constricted; metatarsus incrassate in both sexes. Wings subhyaline with the stigma piceous, and tegulae concolorous or flavescent. Length, 7-10 mm.

Apparently very rare, occurring in Sweden and Germany. Fitch introduced it as British (Entom. 1880, p. 255) on account of a single specimen, bred by Weston from—? *Ephippiphora obscurana* in—galls of *Cynips Kollar*, adding (*l.c.* 1884, p. 227) that Vollenhoven also raised it from *Halias clorana*.

GRAVENHORSTIA, Boie.

Boie, Wieg. Arch. ii. 1836, p. 42; *Odontopsis*, Först. Verh. pr. Rheinl. 1868, p. 150.

Face with a strong and acute tooth below the antennae; clypeus centrally acute at its apex; ocelli small and eyes large. Mesonotum with no distinct notauli; metathorax evenly rounded. Second abdominal segment as long as the first. Claws basally pectinate. Wings with the second recurrent nervure emitted from the cubital distinctly a little before the submarginal nervure, as in the Ophionides; radius not distinctly incrassate basally; discocubital nervure evenly rounded.

In every feature, but the usually considered important one of the second recurrent nervure's emission from the cubitus before the submarginal, this genus is entirely Anomaloid and I do not consider this point sufficient—considering how closely *Erigorgus* approaches it—to place it in the Ophionides, where the whole remainder of its sculpture and conformation are incongruous, as was done by Ashmead and more recently by Schmiedeknecht; Förster considered it a Campoplegid, I know not upon what grounds.

Only one species is known of this conspicuous genus.

1. *picta*, Boie.

Gravenhorstia picta, Boie, Wieg. Arch. 1836, p. 42; Voll. Pinac. pl. iii, figg. 1 et 2; Bridg.-Fitch, Entom. 1884, p. 227, ♂ ♀; cf. Kriech. Progr. Gym. Pola, 1895, p. 39. *Anomalon fasciatum*, Gir. Verh. z.-b. Ges. 1857, p. 170; Marsh. E.M.M. ix, 1873, p. 240, ♂ ♀; cf. Bond, Trans. Ent. Soc. Proc. 1872, p. xlv. *Ophion septemfasciatus*, Tasch. Zeits. Ges. Nat. 1875, p. 428, ♀.

A black species with the mouth, mandibles except apically, clypeus, face, internal and external orbits, underside of scape, two triangular prothoracic marks, two callosities beneath radices, and others behind the hind coxae, with scutellum, trochanters, the second segment, apex of the first and apical half of all the following, flavous. Antennae and legs

flavivous red, with the scape black above and the apical joints discally infusate, the hind femora black-lined below and their tibiae apically black. Length, 17-19 mm.

This large and handsome insect is so conspicuous and unlike any other Ophionid that the Rev. T. A. Marshall's diagnoses, translated above, will serve as ample description.

He believed his specimens to be new to Science, and points out that the abdomen is shorter and stouter and more pyriform than in other Anomalons, while the black and flavous colours are suggestive of the genus *Banchus*; he did not however, remark upon the similarity of its neururation to that of *Ophion* and was satisfied to leave it in the present Tribe.



These specimens "were bred by Mr. Mitford from a supposed permanent variety of *Lasciocampa trifolii*" and were exhibited by Bond "from the cocoons of the supposed variety of *L. trifolii*, obtained from larvae found at Romney" Marsh in Kent. How many emerged is not known; the type of his name is in Marshall's collection, and there is another female with two males also in the British Museum; I possess another co-type, kindly given me by Mr. Oliver Janson, who received it direct from Mitford. That these specimens were really indigenous appears extremely

doubtful, since the species is distinctly southern, as Pfankuch says (Abh. Ver. Brem. 1904, p. 139), in recording a male from Bremen, bred on 24th May from *Bombyx quercus* or *rubi*. Specimens in the Vienna Museum were bred from the S.E. European form *spartii* of *B. quercus*; Taschenberg's female came from Spain; Dr. F. Rudow also thought a southern example to be new and described it (Ent. Nachr. 1882, p. 35) as *Anomalon pictum*; it was bred at Corfu by Sir Sidney Saunders from a *Bombyx* cocoon; Vollenhoven took a female in Holland, Gaulle records it from France, Tosquinet says it is very rare in Belgium, where he found but two examples at Beverloo and Calmpthout in June. Schm. gives it a range from Hamburg to the ruins of Carthage, where he discovered it on the flowers of *Ferula*, the giant umbel; and van Burgst (Tunisian Hymenoptera, 1913) tells us it is "a parasite of the big *Gastropacha*-caterpillars, which are abundant on lower plants along the North-African coast, is not rare in the environs of Tunis" in April; but Marshall had a male from Kiel.

TRIBE

OPHIONIDES.

This Tribe comprises some of our longest Ichneumonides, extending to thirty millimetres in length, though the extremely slender bodies render their appearance distinctly fragile. It differs from the whole remainder of the Ophioninae in the fact that the cubital nervure emits the second recurrent at an appreciable distance before the submarginal nervure; the only exception being in the case of the Continental Hellwigiides, the few species of which are very rare and at once known by the apically clavate antennae. Authors have hitherto regarded *Nototrachys* as the type of a distinct Tribe, and indeed in respect of its somewhat supposititious Coleopterous economy it would appear worthy of such a division, which is characterised in the latest European conspectus by its unicalcarate intermediate tibiae and even mesosternum; as well as by the poor characters of rugosely punctate mesonotum, short antennae and apically produced metathorax, which are in part shared by species of our genus *Ophion*. But as I have shown in my work on the world's Ophionides (A Revision of the Ichneumonidae; part i, Ophionides, 1912, pp. 67, 68), the tibial character, that upon which it was mainly distinguished, is not reliable, and we may with more propriety unite the two under a common heading.

Table of Genera.

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|------|----|--|-----------------------------|
| (2). | 1. | Intermediate tibiae unicalcarate;
antennae shorter than body .. | NOTOTRACHYS, <i>Marsh.</i> |
| (1). | 2. | Intermediate tibiae bicalcarate;
antennae strongly elongate. | |
| (4). | 3. | Disco-cubital cell not corneous below
stigma; discoidal cell broad .. | OPHION, <i>Fab.</i> |
| (3). | 4. | Disco-cubital cell corneous below
stigma; discoidal cell narrow .. | HENICOSPILUS, <i>Steph.</i> |

NOTOTRACHYS, *Marshall.*

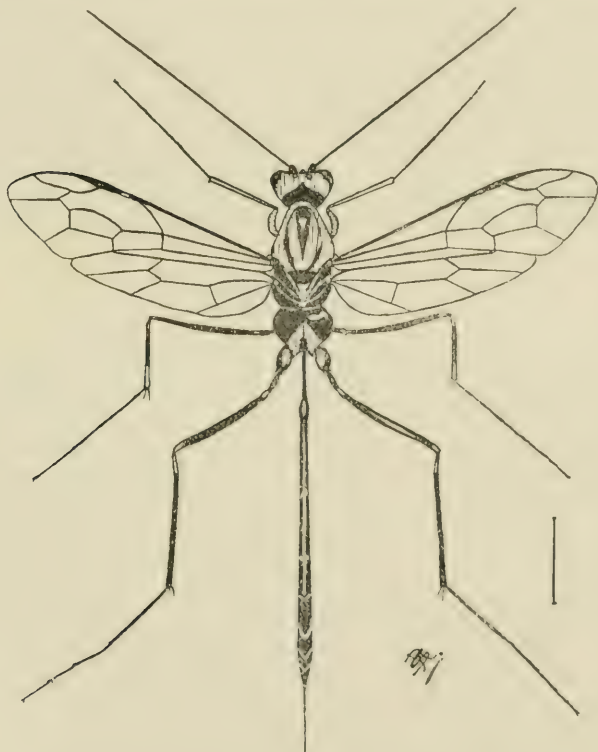
Marsh. Trans. Ent. Soc. 1872, p. 260; *Trachynotus*, Gr. I.E. iii. 713 (*nec* Latr.).

Head posteriorly buccate, clypeus not discreted and apically reflexed, mandibular teeth unequal in length and not slender; eyes internally not or hardly emarginate, apically convergent. Antennae slender, filiform and shorter than body. Thorax rugose or mainly smooth; metathorax longitudinally and transcostate throughout, with areae obsolete and spiracles sublinear. Scutellum circumcarinate. Abdomen petiolate and a little compressed, spiracles beyond centre of first segment, terebra distinctly exerted. Legs slender and not elongate, anterior tibiae unicalcarate and hind ones curved, claws subpectinate only at their base. Wings short and small, with neither glabrous areae nor corneous marks; second recurrent emitted from cubital before submarginal nervure; nervellus not geniculate. Size not large; palaearctic colour mainly black.

1. *foliator*, Fab.

Ichneumon cruentatus, Fourc. E.P. ii. 1785, 418 (?). *I. petiolatus*, Fourc. l.c. 396; Vill. Linn. Ent. iii. 188; Oliv. Encycl. Méth. vii. 206 (?). *Ophion foliator*, Fab. E.S. Suppl. 1798, 239; Blanch. Hist. Ins. iii. 326. *Bassus foliator*, Fab. Piez. 100; Grav. Mag. Entom. 1821, p. 271, ♂ ♀. *Trachynotus foliator*, Gr. I.E. iii. 715; Westw. Introd. Synop. 60; Holmgr. Sv. Ak. Handl. 1858, p. 13; Tasch. Hym. Deut. 70, ♂ ♀. *Nototrachys foliator*, Bridg.-Fitch, Entom. 1884, p. 180; Schm. ♂ ♀.

A very coarsely and rugosely reticulate species; dull with only occiput, mesonotal base and speculum smooth; black or piceous, darker in ♂. Head usually mainly red and thorax indefinitely, especially prothorax and



mesonotum laterally and scutellum, concolorous; vertical orbits usually flavous-marked. Antennae filiform and hardly longer than thorax. Metathorax short, convex and declived from the small and glabrous arcola. Abdomen finely alutaceous with base and apex smoother; more or less, and especially with incisures and petiolar base, rufoescent; terebra as long as the second segment, with valvulae apically subexplanate. Legs red, more or less nigrescent; the front ones flavidous; all the tibiae basally whitish and the hind ones curved. Wings short and usually hyaline. Length, 10–14 mm.

Marshall in 1872 considered this species as doubtfully British; and all our authors seem to have overlooked the only definite indigenous record, which is to be found in Abel Ingpen's "Instructions," 1839, p. 62, where Southend in Essex is given as the local habitat of "*Trachynotus foliator*" and Desvignes' three females, in the National Collection as early as 1856, may have originated there; it was known to Westwood in 1840. But I, like Bridg.-Fitch, "know of no recent captures. It should occur with us, as the species is generally distributed," occurring about oaks in the late summer, though much commoner in some than in other years. It is not rare in Sweden, Petersburg, Holland (figured in Voll. Schetsen, i, pl. ii, fig. 23), somewhat frequent in Belgium, Germany, France, Spain at Elche and Algeciras, near Vienna, in Piedmont, Parma and Sicily; Marshall has given me several from Ajaccio and the Rev. F. D. Morice from the Pisa coast in the middle of May, whence it extends through Albania and Corfu, Athens and Olympia, across Persia to India, becoming gradually gayer and of more varied coloration as it proceeds eastwards; and it is not infrequently found through Tunis to Algeria. Its confirmation as British will rest with our coleopterists, for it was once bred by Perris from the Cistelid beetle, *Hymenorus Doublieri*, Muls. (Giraud, Ann. Soc. Fr. 1877, p. 403), which has a distribution through southern France, Borussia and the Tyrol; and once from its close relative, *Gonodera (Eryx) melanarius*, Germ. (*leavis*, Rosh.), of Germany and northern Italy (Gaulle, Cat. 72).

OPHION, *Fabricius*.

Fab. E.S. Suppl. (1798), 210.

Head usually constricted posteriorly, clypeus hardly discreted and apically truncate with distinct basal foveae, eyes internally emarginate, ocelli large, mandibles stout and apically equally bidentate. Antennae multi-articulate and usually very slender. Thorax obsoletely sculptured with metathoracic areae rarely entire, usually one or two transcarinae alone strong, spiracles sublinear. Abdomen petiolate and strongly compressed with basal segment usually sublinear throughout, rarely apically intumescant, spiracles distinctly beyond its centre; terebra not longer than the subtruncate anal apex. Legs slender and strongly elongate, tibiae always bicalcarate and claws densely pectinate. Wings ample and often large, rarely with glabrous area below stigma and never with corneous marks therein; second recurrent emitted from cubital before the submarginal nervure. Large insects, with the colour usually testaceous.

The cocoons of this genus are familiar objects to the pupa-digger at the base of trees. They are all broadly cylindrical, hardly twice longer than broad and of equal breadth at both extremities, black or brown, usually with a paler central girdle and often of beautiful iridescent colours, especially internally. In every instance the parasite allows its host to go to earth and in the case of the smaller kinds to pupate, since the parasite's cocoon is found within the Noctuid host's chrysalis; though in the case of Bombyces and other cocoon-weavers I have never discovered that they attain the pupal condition. The attraction exercised by sweets for the perfect insects of this genus is known to everyone, and lepidopterists very frequently find them upon their sugared trees; like testaceous Hymenoptera in general, they are said to be nocturnal in their habits, though I think too little evidence has at present been adduced to prove the supposition.

It is entirely open to question how far the description of various forms of *Ophion luteus* serves any good purpose. Their stability can only be ascertained in a positive degree by breeding, and even therein the resultant parasites are doubtless influenced to an unknown degree by the vicissitudes through which their hosts of varying size may happen to pass. However, Thomson, Kriechbaumer and Brauns have split off certain forms under specific names and all of them are comparatively recognisable, for nothing but distinction is necessary in description of so closely allied species or forms of a species as those of this restricted genus as now understood. In the examination of my two hundred and fifty examples of this small group I obtained sufficient experience to convince me that the minor distinctions of relation between upper and lower basal nervure, angulation between basal and apical abscissae of radius, etc., were of little stability and that neither the exact development of metanotal carinae nor approximation *inter se* of the ocelli could be relied upon. I have retained *O. obscurus* as a single species, though the mandibles are occasionally acute or obtuse, pointing to either the existence of two species under this name, or instability of mandibular structure to which I am not inclined to give credence. Thomson's species are perfectly good, though the mandibles will more satisfactorily distinguish one from *O. luteus* than the scutellar carinae, which seem to me of variable development and not always present.

Table of Species.

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| (28). | 1. Radius basally straight and not at all incrassate [<i>OPHION</i> , <i>sensu stricto</i>]. | |
| (27). | 2. Wings subhyaline; petiolar membrane nearly reaching spiracles. | |
| (24). | 3. Mesonotum unicolorous or with no bright flavous lines. | |
| (17). | 4. Mandibular teeth subacute and not short; scutellum laterally immarginate. | |
| (6). | 5. Metanotal areola complete; stigma centrally stramineous | 1. <i>MOCSARVI</i> , <i>Brauns</i> . |
| (5). | 6. Metanotal areola not indicated; stigma always darker. | |
| (14). | 7. Stigma clear testaceous throughout; third segment not strongly constricted. | |
| (13). | 8. Basal metanotal transcarina distinct; species large. | |
| (12). | 9. Ocelli touching eyes; cheeks obsolete; vertex distinctly narrow. | |
| (11). | 10. Hind calcaria linear throughout; ocelli collectively subpyramidal | 2. <i>LUTEUS</i> , <i>Linn</i> . |
| (10). | 11. Hind calcaria basally incrassate; ocelli distinct <i>inter se</i> | 3. <i>CALCARATUS</i> , <i>Morl</i> . |
| (9). | 12. Ocelli remote from eyes; cheeks long; vertex broader | 4. <i>DISTANS</i> , <i>Thoms</i> . |
| (8). | 13. Basal metanotal transcarina wanting; species small | 5. <i>PARVULUS</i> , <i>Kriech</i> . |
| (7). | 14. Stigma ferrugineous, always basally white; third segment constricted. | |
| (16). | 15. Antennae filiform, not longer than half body; temples broad | 6. <i>FORTICORNIS</i> , <i>Morl</i> . |

- (15). 16. Antennae attenuate, longer than body; temples narrow 7. *STIGMATICUS*, *Morl.*
 (4). 17. Mandibular teeth obtuse and very short; scutellum often margined.
 (19). 18. Head posteriorly broader than eyes; face apically parallel 8. *LONGIGENA*, *Thoms.*
 (18). 19. Head posteriorly not broader than eyes; face apically constricted.
 (23). 20. Antennae attenuate, slender and not shorter than body.
 (22). 21. Stigma white-marked; antennae of ♂ half as long again as body . . . 9. *LONGICORNIS*, *Brauns.*
 (21). 22. Stigma all testaceous; antennae of ♂ not longer than body 10. *SCUTELLARIS*, *Thoms.*
 (20). 23. Antennae subfiliform, stout and shorter than body 11. *BREVICORNIS*, *Morl.*
 (3). 24. Mesonotum with four distinct bright flavous lines.
 (26). 25. Nervellus subopposite; metanotal transcarina strong 12. *OBSCURUS*, *Fab.*
 (25). 26. Nervellus postfurcal; metanotal transcarina wanting 13. *MINUTUS*, *Kriech.*
 (2). 27. Wings flavescent; petiolar membrane extending to centre . . . 14. *VENTRICOSUS*, *Grav.*
 (1). 28. Radius basally strongly curved and incrassate.
 (32). 29. Base of radial nervure simply curved, not bisinuate.
 (31). 30. Mandibles vertical; petiole black [EREMOTYLUS, Först.] 15. *MARGINATUS*, *Grav.*
 (30). 31. Mandibles horizontal; petiole flavous [STAUKRODOCTONUS, Brauns.] . . 16. *BOMBYCIVORUS*, *Grav.*
 (29). 32. Base of radius strongly bisinuate [ALLOCAMPTUS, Thoms.] 17. *UNDULATUS*, *Grav.*

1. *Mocsaryi*, *Brauns.*

Ophion Mocsaryi, Brauns, Arch. Nat. Meckl. 1889, p. 89.

Head constricted behind eyes, which are contiguous with both ocelli and mandibular base; epistoma laterally subsulcate; orbits flavous. Antennae about as long as body. Thorax somewhat shining; both transcarinae of metanotum distinct and elevated, connected on either side of their centre by a longitudinal carina, forming a distinct areola, with externally unbounded transverse lateral areae; petiolar area large and discreted, with hardly a trace of longitudinal striae. Legs red and normally stout. Stigma centrally very pale testaceous, whitish at both extremities; basal and discocubital nervures strongly convergent, with elongate nervelet; lower basal nervure antefurcal; nervellus intercepted slightly below its centre. Length, 13–14 mm. (Brauns) or 15–17 (British). ♀ only.

Brauns appears to have described a single unsexed example differing from *O. costatus*, Ratz., in its smaller size, opposite nervellus, geniculate discocubital nervure and the nervelet; and from his own *O. areolaris* in the immaculate testaceous mesosternum and distinct basal metanotal transcarina.

It is our only species with distinct areola.

This insect seems very rare in Britain, whence it has not before been recorded. Females, agreeing exactly with the original description, were bred with some doubt from a species of *Taeniocampa* in May, 1894, by W. Harrison and with equal doubt in June, 1899, from *Amphydasis betularia* at Lowestoft by Bedwell; Clutton sent me one cocoon from an uninstanced Lepidopteron in April, 1910, whence another female emerged during the following month; and Esam has also given it me from the Hastings district. Elsewhere it is only known from Hungary, where Mocsáry bred it from the Noctuid moth, *Cirrhoidea* (*Cosmia*) *ambusta*.

2. *luteus*, Linn.

Ichneumon luteus, Linn. S.N. 1758, 566; Harris, Aurelian, 1766, pl. 7; Berkenhout, Nat. Hist. Brit. 1769, 166; nec DeGeer, Mem. ii. 1771, 851. *I. vinulæ*, Scop. Ent. Carn. 1763, 286; Christ. Naturg. 1791, 367. *I. fulvus*, Retz. Gen. et Spp. Ins. 1783, 68. *Ophion luteus*, Fab. E.S. Suppl. 1798, 235; Piez. 130; Gr. I E. iii. 692; Curt. B.E. 600; Thoms. O.E. xii. 1190; Brauns, Arch. Nat. Meckl. 1889, p. 90, ♂ ♀. *Joppa lutea*, Panz. Krit. Revis. ii. 66. *Ophion vinulæ*, Dale, Ann. Nat. Hist. vii. 1834, p. 60.

A not very pale testaceous species, with diffuse pubescence. Head of normal size with vertex not broad and temples not broader than eyes, which are contiguous or subcontiguous with both ocelli and base of the acutely bidentate mandibles. Antennae about as long as body, 57-62-jointed. Scutellum not laterally carinate and rarely, with the thorax never, clear flavous-lined. Areola wanting; basal transcarina of metanotum always distinct, the apical centrally interrupted by two more or less distinct longitudinal carinae which extend to apex of the discreted petiolar area. Intermediate calcaria strongly unequal in length, and both the hind ones linear. Wings hyaline, very rarely slightly flavescent towards their base; stigma unicolorous testaceous, not basally paler; nervelet distinct, of variable length; lower basal nervure antefurcal or continuous through median; nervellus subopposite and intercepted centrally. Length, 15-22 mm.

Known by the approximation of ocelli and mandibular base to eyes, which are apically subconvergent internally, the apically acute mandibles, mutic scutellum, somewhat narrow vertex, linear hind calcaria and unicolorous stigma. I believe the occasional anal infuscence to be invariably accidental and posthumous; the whole insect will become black, if allowed to rot in a confined space.

Ophion luteus was known as early as 1662, when Gödard published his Metam. & Hist. Insect., where it is figured at plate xxxvii; and in 1710 Ray (Hist. Ins. p. 253) had recognised it as British. Its distribution extends from India, whence I have seen it, to the Straits of Magellan, whence it was correctly recorded by Haliday (Trans. Linn. Soc. 1836, p. 316; cf. Entom. 1911, p. 212); I possess it from Saskatchewan and Hutton records it (Cat. Dipt. etc., 1882) from New Zealand.

Of this species, as here restricted, I have a hundred examples: from the New Forest (Miss Chawner), in May (Adams), where it has been bred in 1912 from *Cymatophora ridens* and *C. flavicornis* (Lyle); Guestling (Bloomfield); Deal (Lyle); Rye, settled on a larva of the Curculionid, *Lixus algerius* in August (Donisthorpe, Tr. Ent. Soc. 1907, p. 45); Southampton (Gorham), Weymouth (Peachell), Bristol (Charbonnier), West Somerset in May (Slater), Plymouth (Keys), Redruth near Truro (L. Smith);

Chiswick (Sich), London (Newbery), Kew Gardens (G. Nicholson); Suffolk (Garneys), Ipswich (Platten), Oulton Broad (Bedwell), Tostock and Wicken Fen (Tuck), bred at Ely (Cross), bred from—? *Sesia* in—reeds at Boxworth in Cambs (Thornhill); S. Leverton in Notts and Ashby in Lincs (Thornley); Barnsley in Yorks (Porritt); Barmouth (Yerbury), Milford Haven (Andrews); Kilmore in Ireland (Beaumont); Bonhill (Malloch) and Glenford Loch (Dalglish). My bred examples are from G. W. Clutten, who raised it at Burnley from *Taeniocampa instabilis* in 1899, at Southport from *Dianthaecia capsicola* in 1900, at Burnley from *Hadena glauca* and a brood from *H. pisi* in 1901, and at Blackpool from *Agrotis praecox* in 1907; Wigin dug up five cocoons at Methley near Leeds in 1900, of which two contained hyperparasitic Chalcids that all emerged through a single hole in the cocoon and in one of them the Chalcids were healthy larvae on 5th April, 1902, one died of mould and the last produced a male of the present species, which emerged before 10 a.m. on 18th May, 1901; of those bred from *H. pisi*, all that were observed emerged before 10 a.m. Kaye sent me one ex *Hecatera dysodea* on 9th October, 1900. Personally I have met with *O. luteus* frequently at light—in incandescent street lamps in Ipswich, at oil lamps in Monks Soham House and Tuddenham Hall in Suffolk, always in August and between 8.30 and 10 p.m.;—at Bramford near Ipswich it was on flowers of *Clematis vitalba* on 15th August, 1896, and at Covehithe on those of ragwort on 10th September, 1912; I have swept it in the Brandon marshes early in June and seen it flying along the shady side of hedges at Market Rasen in Lincs and Heacham in Norfolk, where it came to light in Hunstanton; it occurred on reeds in the Southwold salt-marshes early in September, 1910, and is abroad till the end of that month, though I have no later records, and it is almost unknown in July. As a general rule it comes to light only in August, and was unusually abundant in 1906, when two or three would gyrate around the lamps every evening.

How far the notices of the earlier hosts relate to the species as now understood must remain uncertain.

The few available records are from Holgate near York (Wilson, Yorks Nat. 1880, p. 105), Bradford (Bradf. Sc. Journ. 1908, p. 71), common in Norfolk (Bridgman), S. Devon (Bignell), Lands End (Marquand); Acton Glebe, Co. Armagh (Johnson, Irish Nat. 1904, p. 256). It is recorded as bred with us from *Dianthaecia capsicola* and *D. cucubali* (Marshall, Ent. Ann. 1874); *Hadena pisi* (H. Marsh, Entom. 1881, p. 139), *Leucania lithargyria* (Butler, l.c.), *Miselia oxyacanthae** (Bignell, l.c. 1883, 65) in S. Devon on 25th May (S. Devon List), *Taeniocampa populeti* by Bignell and *Bombyx quercus* in Marshall coll. (Bridg.-Fitch, Ent. 1884, p. 179), *Demas coryli**, *Paecilocampa populi**, *Acronycta leporina**, *Agrotis praecox** on 18th July, all in S. Devon (Bignell's List). On the Continent, Brischke is said to have raised it from *Sesia formicaeformis*, *Demas coryli*, *Dicranura bifida*, *Cymatophora flavicornis*, *Acronycta aceris*, *Cucullia scrophulariae*, *absynthii*, *chamomillae*, *artimisiae*, *argentea*, *thapsiphaga*, *mixta*, and *abrotani*; Ratzeburg from *Lasiocampa pini*, *Trachea piniperda*; Grav., Curtis and De Geer from *Dicranura vinula*; Drewsen from *Dipterygia pinastri*, *Dianthaecia cucubali*; Gravenhorst from *Agrotis praecox*; Giraud from *Taeniocampa munda*, *Cucullia verbasci*, *chamomillae* and *artemisiae*; and Mocsáry from

* By a careless misreading of Bignell's List, Schmiedeknecht ascribes these five hosts to *Ophion obscurus*, Fab.

C. argentina, Hüfn. It appears very improbable that De Geer's parasitic larva, which emerged from its bulbiriferous egg and was an ectoparasite (*loc. cit.* et Kirby and Spence, ed. vii. 154) was referable to the present genus.

3. *calcaratus*, sp.n.

A very pale testaceous species, with close pubescence. Head nearly as broad as eyes with vertex not very narrow, its ocelli contiguous with eyes but widely discreted *inter se*. Antennae usually infusate. Apical metanotal transcarina obsolete, though the two longitudinal costae extend to apex of metathorax and are often distinct. The inner hind calcar distinctly incrassate towards its base and strongly ciliate. Length, 19–22 mm. ♂ ♀.

I have ventured to discriminate a large and slender form with the elongate conformation and close pubescence of *O. distans*, but differing from *O. luteus* in little but its longer body and distinctly incrassate inner hind calcaria, as a distinct species.

This is an undoubtedly uncommon form of the last species, or rather of the next one to which its large and slender build more closely allies it. A pair was first taken by Mr. W. H. Tuck at Tostock in Suffolk during the middle of September, 1898 and 1899; Mr. E. W. Platten found males on the Ipswich street lamps in October, 1900; and I have subsequently caught both sexes between 8.30 and 10 p.m. around my study lamp at Monks Soham, but it occurs only singly and my earliest date is 17th August.

4. *distans*, Thoms.

Ophion distans, Thoms. O.E. xii. 1191; Brauns, Arch. Nat. Meckl. 1889, p. 91, ♂ ♀.

A very pale testaceous species, with close pubescence; large and slender. Head with vertex not very broad and temples a little narrower than eyes, which are distinctly remote from ocelli and to a lesser degree from the mandibular base. Intermediate calcaria strongly unequal in length. Length, 18–22 mm.

Similar to *O. luteus* in size and conformation, though more slender with the whole body and especially the abdomen more densely pubescent, the vertex less narrow, but especially distinct in the obviously remote ocelli from the eyes. Brauns was sceptical of its specific value and his doubt is legitimate, but the distinct ocular position is sufficiently obvious to admit of some differentiation from typical *O. luteus*.

This large pale form with distinct cheeks and vertical orbits is by no means rare with us, though only recorded from Sweden and brought forward as British with a query by Bridgman in 1889 (Trans. Ent. Soc. p. 419) on the strength of examples bred by Cross at Ely and by Bignell from *Dianthacea irregularis* in Devon; he says the cocoon is unicolorous pale brown; and subsequently records the species without hesitation from Norfolk. I have examples from Guestling (Bloomfield), St. Ives (Wainwright), Felton near Bristol (Charbonnier), Shere (Capron), Felden (Piffard), Aldeburgh (Tuck), Tuddenham Hall at light (Elliott), Lincoln at light (Musham), Manton Common in Lincs (Thornley), Barnsley at electric light (Bayford), flying over heather in April of 1899 at Galashiels

(Haggart), and from Irvine Moor in July, 1900 (Dalglish). Clutten sent me eight cocoons from *Agrotis praecox* in October, 1908, from which six parasites emerged between 10th and 15th of the following June; I bred it at Ipswich on 6th June, 1894, and have met with it there in August at electric light, at Alderton on *Foeniculum vulgare* and at Peterborough on *Heracleum sphondylium*; but this genus is very rarely seen on flowers and more usually found, as is the present species at Monks Soham, at light and on yew-tree leaves in the mid-September sunshine, occasionally flying about hazel in lane hedges, as I noticed it near Southwold early in September, 1911. Excepting those bred, I have no record of its occurrence before the middle of August.

5. *parvulus*, Kriech.

Ophion parvulus, Kriech. Ent. Nachr. 1879, p. 104, ♂ ♀ (nec Voll. Pinac. pl. xxxix, fig. 2, ♂).

A small rufescent-testaceous species, with diffuse pubescence. Head not posteriorly broad; eyes contiguous with ocelli and mandibular base; orbits indefinitely flavous. Antennae as long as or a little longer than body. Thorax unicolorous; metathorax with but slight trace of carinae—areola, and the basal transcarina usually entirely wanting; ♂ mesonotum and metathorax sometimes infuscate. Scutellum not laterally carinate. Wings hyaline; stigma pale flavous and not small; nervelet elongate or wanting; nervellus postfurcal, intercepted hardly below its centre. Length, 12 mm. (Kriech.) or 9–10½ (British).

Distinct in its small size and wanting basal metanotal transcarina from all other *Ophiones*, except *O. minutus*, from which I find nothing but colour to distinguish it. In the British examples the stigma is unicolorous red, and the nervelet distinctly short.

Extremely rare with us, and not hitherto noticed as British. I first took a male on oak in the New Forest at Brockenhurst on 16th May, 1895; but it probably occurs in all our more southern wooded districts, since another turned up on eight-foot birch bushes in Assington Thicks on 17th May, 1901, and a female was taken flying about birch bushes on the afternoon of 29th May, 1902, in the Bentley Woods, also in Suffolk. Kriechbaumer described a single pair bred in Bavaria from pupae of *Plastenis retusa*. I do not know where Mocsáry records it from *Cucullia tenaceti*, Schäff. and *C. artemisiac*, Hufn., as given by Dalla Torre (Cat. 197). My examples are very different from Vollenhoven's male figure, with its remote ocelli and stramineous stigma; the species is not mentioned at *l.c.* p. 61, as indicated by several authors.

6. *forticornis*, sp.n.

A rufescent testaceous species, with close pubescence. Head with vertex somewhat narrow, but temples as broad as eyes which are nearly contiguous with ocelli and mandibular base. Antennae hardly longer than half body, unusually stout and filiform throughout, with only forty-five flagellar joints. Scutellum except centrally, and four indistinct mesonotal longitudinal lines, obsoletely flavidous; metathorax dull and closely shagreened, its basal transcarina strong but the apical indicated only at apophyses. Third abdominal segment distinctly constricted basally.

Wings hyaline, with all the costa and nervures quite black to apex; stigma dark ferruginous, with its base almost white. Length, 15 mm. ♀ only.

Very distinct in its antennal structure and remarkably dark nervures, which consequently appear much stouter than is usual in this genus. The type has the lower basal nervure antefurcal in one wing and continuous through the median in the other.

This species doubtless preys upon some coast species of Noctuid moth, since it was first found beneath a stone on the sandhills at Felixstowe on the Suffolk coast on 6th May, 1897; and a second female was sitting on 7th May, 1900, under the ledge of a paling, actually resting in the sand of the beach, within a couple of hundred yards of the same spot. So few Ichneumons frequent the shore that I took these by chance while collecting Coleoptera.

7. *stigmaticus*, sp.n.

Head small and posteriorly narrow, with eyes contiguous with ocelli and base of the apically acute mandibles. Antennae elongate, distinctly longer than body, slender and attenuate. Thorax unicolorous; basal metanotal transcarina strong, the apical entirely wanting though the petiolar area is centrally finely bicarinate longitudinally. Third abdominal segment distinctly constricted basally. Wings ample and hyaline, with nervures not black; stigma clear ferruginous, with its base almost white; nervelet distinct. Length, $17\frac{1}{2}$ –20 mm. ♂ ♀.

The elongate antennae and much darker stigma with its obviously pale base will distinguish this species from *O. luteus*, and its acute mandibles from all the following.

One form has the stigma very dark and cubital cell apically narrow and acute; in a second, which is hardly specific, the stigma is paler with cubital cell apically broader and obtuse.

Probably quite an early species; Col. Nurse has bred it in west Suffolk on 10th March, 1912; both Mr. Musham and I took it on 12th April, 1899, on sallow blossom at Lincoln and flying among *Pinus sylvestris* in the Bentley Woods in Suffolk; Langford Moor, Nottingham (Prof. Carr); the latest date is June 10th, when the Rev. C. D. Ash caught it flying over heather at Skipworth in Yorks and thought it "very possibly parasitic upon *Agrotis agathina*." Mr. W. G. Clutton bred four specimens, together, from *Boarmia repandata* at Delamere Forest in 1912. My other examples are without data from Mr. J. A. Clark's collection and one had emerged from its smooth, dull golden cocoon, which is infusate at both extremities. Inchbald's letter to "The Field" of Jan. 3rd, 1880, may be noticed in connection with Ash's record; he says that on Nov. 18th, 1879, in the North Riding of Yorkshire he saw a whole flight of tawny-coloured Ichneumon-flies of the genus *Ophion* on a moor. They kept constantly alighting on the heads of the ling and heather, though it was difficult to discern their object in doing so.

Since the above was written I have seen three New Forest males in Lyle's collection: he says "This species evidently passes the winter in the imago state but remains within its cocoon; I have opened the cocoons and taken out the live and perfect Ophions in December and January"; he bred it from larvae of *Triphaena fimbria* and *Noctua xanthographa*; and took it near ivy blossom on 15th October, 1908.

8. *longigena*, Thoms.

Ophion longigena, Thoms. O.E. xii. 1191; Brauns, Arch. Nat. Meckl. 1889, p. 90.

A very stout species, rufescent testaceous, with no trace of flavous markings; anus of ♀ determinately black from base of fifth segment. Head large; vertex broad and temples distinctly a little broader than eyes, from which both the ocelli and mandibular base are obviously remote. Antennae not longer than body, attenuate and somewhat stout. Metanotal carinae rarely weak, but petiolar area always elevated at base of its two longitudinal central carinae. Third abdominal segment subconstricted basally. Intermediate calcaria nearly equal in length. Wings often distinctly flavescent, with nervelet short and distinct, discocubital nervure convergent with upper basal and the red stigma somewhat narrow. Length, 19–22 mm. ♂ ♀.

Much stouter than *O. luteus*, with the colour clearer and the face apically parallel-sided. The cheeks are buccate and elongate, and the ocelli remote from vertical orbits. I have none of the intermediate forms mentioned by Schmiedeknecht and consider it one of the most distinct species of the genus in its very stout body and legs. One of my examples has a distinct metanotal areola and it is possible, though very improbable, that *O. costatus*, Ratz., with its contiguous ocelli, posteriorly slightly narrowed head, etc., is synonymous.

I fancy Thomson and Brauns can have known only the male of this species, though neither specify sex; it is said to have been bred abroad from *Cucullia formosa* and *C. chamomillae*. A male, agreeing in every particular with the former's description, was "bred at Corfe Castle on 4th July, 1901, from *C. chamomillae*, Schiff., by E. R. Bankes; and Bridgman, who was uncertain that he correctly recognised it in bringing it forward as British (Trans. Ent. Soc. 1889, p. 419), says a single example with no capital flavous marks was bred on June 11th, 1888, by Bignell from *C. scrophulariae*. Both these moths are very rare in Suffolk, which may account for the uniqueness of my capture of three females of this parasite upon the flower-tables of *Heracleum sphondylium* on the Southwold cliffs in the middle of July, 1901; I have worked the same spot for ten years and seen no more; it was upon this occasion that I noticed (*cf.* Ichn. Brit. i. xxvi) that these insects are not easily disturbed when feeding, but when they are thoroughly roused they fly off hurriedly, careering wildly like a *Tipula*, for a distance of twenty or thirty yards. Another female was acquired without data from Clark's London collection; and Prof. Carr has sent me a male, taken on the wing at Langford Moor in Nottingham on 2nd September, 1911. The original locality is Töringeland near Malmö, at the south point of Sweden, in the latitude of Dumfries; it has since been recorded from Germany only.

9. *longicornis*, Brauns.

Ophion longicornis, Brauns, Arch. Nat. Meckl. 1889, p. 92.

Head very small and posteriorly constricted; ocelli remote from eyes and from each other; cheeks not short. Antennae of ♂ half as long again as, of ♀ hardly longer than, the body. Mesonotum subinfusate, with two longitudinal testaceous lines; basal metanotal carina weak,

the apical entirely wanting and petiolar area not centrally bicarinate; apophyses not strong. Scutellum usually obsoletely carinate laterally. Legs slender and elongate, with tarsi especially long. Stigma somewhat pale testaceous, with both extremities distinctly whitish; lower basal nervure continuous, of ♂ sometimes subpostfural, of ♀ often antefural; nervellus intercepted a little below its centre. Length, 14–18 mm. ♂ ♀.

Both sexes are readily known by the small and posteriorly narrow head, the basally and apically white stigma which they share with no other species, and by the unifusate mesonotum; the ♂ is remarkable for the extraordinary length of its antennae of seventy joints, a number equalled throughout the Ichneumonidae only by the ♂ of *Henicospilus ramidulus*.

Dr. Brauns appears uncertain respecting the sex of his Mecklenburg type and Schm. assigns none to the numerous Thuringian specimens he considers to belong to this species. It has not hitherto been recorded from Britain, but there can remain no doubt that three males in my collection are correctly here placed. Esam took one "under a stone in fields above the railway at St. Leonards, with its head just visible at the entrance to a hole, in March, 1899"; H. Crowther sent the second from Westwood near Sheffield, November, 1877; and the third is from Clark's London collection. The females are arbitrarily associated; one came to light at Withycombe Hill in Somerset on 29th September, 1908, and was taken by Slater; Buckell sent the second from Romsey in Hants; and the last was bred at Monks Soham on 4th June, 1909, from some Noctuid pupa at roots of garden lawn. Lyle, who has thrice bred this species from larvae of *Agrotis porphyrea* in the New Forest, tells me "the parasitic larva emerges from host in April or rarely May. The imago of the *Ophion* sometimes remains through the winter in its cocoon and when it emerges in the autumn hibernates as such, since in March, 1904, I found one crawling on heather; this may have been a very early emergency, however."

10. *scutellaris*, Thoms.

Ophion scutellaris, Thoms. O.E. xii. 1192; Brauns, Arch. Nat. Meckl. 1889, p. 92.

A testaceous species, with the orbits and sometimes scutellum flavous; head not broad; ocelli contiguous with eyes. Antennae of normal length. Metanotum with two more or less strongly developed transcarinae; petiolar area centrally bicarinate. Scutellum (in form typ.) laterally carinate nearly to its apex. Abdomen with second and third segments strongly constricted basally. Stigma unicolorous clear testaceous; basal nervure antefural or (in form typ.) continuous through median; nervellus centrally intercepted. Length, 14–19 mm. ♂ ♀.

Thomson says it is of the size and conformation of *O. luteus*, but with the capital vertex shorter and more strongly narrowed, the intermediate calcaria only a little unequal in length, the basal nervure continuous, petiole longer and scutellum acutely margined. The basal constriction of the second and third segments in my examples is stronger than in any allied kinds. It is, however, an extremely variable species and, in its more untypical forms, I am able to distinguish it from *O. luteus* solely by the extremely obtuse, apically almost truncate, mandibular teeth.

A very common species, of which I possess some forty examples from lime in Bushey Park early in June (Sich), Bewdley (W. Ellis), Lacey in the Isle of Man (Dr. Cassel); and Brandon in Suffolk (Elliott), where it

has occurred to me on the open, wind-swept heath beneath stones and at roots of *Senecio jacobaeae*. In my Monks Soham garden it flies in the August sunshine, occasionally alighting on whitethorn hedges and I have once bred it here from a Noctuid chrysalis; early in September, 1902, it was hovering among bracken at Foxhall, and Musham has bred it at Lincoln. It has frequently been raised from Lepidoptera: from *Mamestra brassicae* in a Methley garden near Leeds by Wiggin in 1899, and others emerged from the same locality at 11 a.m. on 2nd and 2 p.m. on 3rd June, 1900, which were received the preceding November; one sent by Cross from Ely was out with dry wings at 10 a.m. on 14th May, 1901, and another at the same hour on 19th May, 1902, from a Noctuid pupa. At the end of 1901, Clutton sent from Burnley a batch of eight cocoons from *Hadena pisi* and *Dianthaea capsicola*, which emerged between the 1st June and 11th July, 1902, showing that similar temperature, etc., does not cause these insects to emerge simultaneously; though two of a brood of three emerged on 21st and 22nd April, 1902, from their own cocoons, within the cocoons of *Orthosia lola* dug from the sand at Blackpool, which had not been permitted by the parasites to pupate. These last emerged during the daytime and early morning; and in 1910 Mr. Clutton kindly sent a further batch of three from the same host at St. Annes, which emerged between the 6th and 12th May following. On 1st August, 1907, he sent me a couple from Doncaster *Cesmia trapezina*, which emerged on 12th and 15th May, 1908. It is wide-spread through Sweden, Kurland, France and Belgium; but it has been neither bred nor previously noted in Britain.

11. brevicornis, sp.n.

Among the numerous examples in my collection of the last species is a pair which I propose to consider distinct solely on account of the remarkable antennal brevity; those of the ♀ extend hardly beyond the metathoracic apex, while the ♂ flagellum reaches only to the apex of the postpetiole. The ♀ antennae are subfiliform and testaceous, those of the ♂ are apically attenuate and subinfusate. The scutellum is not margined, nor are the basal segments constricted. Length, 13-14 mm. ♂ ♀.

The type of this sufficiently distinct species was captured by Mr. E. W. Platten in the Bentley Woods near Ipswich in Suffolk on 2nd June, 1899. A male was presented to me by the late Mr. E. G. J. Sparke, B.A., F.E.S., who took it in Surrey during the summer of 1900.

12. obscurus, Fab.

Ichneumon luteus, Schr. En: Insect. Austr. 1781, 371; Fauna Boica, 1802, 262; Oliv. Encl. Méth. 1792, 195, ♂ ♀. *I. polyguttator*, Thunb. Bull. Ac. Petersb. 1822, p. 272. *Anomalon obscurus*, Jur. Nouv. Méth. 1807, 116, ♂ ♀. *Ophion obscurus*, Fab. Piez. 1804, 132; Gr. I.E. iii. 689; Staveland, Trans. Linn. Soc. 1860, pl. xvi, fig. 17; Voll. Pinac. pl. xxviii, fig. 2; Thoms. O.E. xii. 1191; Brauns, Arch. Nat. Meckl. 1889, p. 91, ♂ ♀.

Testaceous with head except mouth and centre of face, thorax except disc and sternum, and scutellum except basally in the centre, indefinitely pale flavous; mesonotum always with four longitudinal flavous vittae.

Metanotal carinae of very variable development, usually as in *O. luteus*. Stigma testaceous, basally paler; nervelet short or obsolete, never elongate. Length, 15–22 mm.

This has been recognised as a species distinct from *O. luteus* since 1804, but in reality there is little beyond colouration—especially the pale mesonotal vittae and base (also often apex) of stigma—to distinguish it, as Vollenhoven, who wished to unite the two in 1878, justly remarks.

By no means so common with us as has been generally supposed and merely occurring in single specimens; I have examples extending only from Surrey to Lincolnshire. Wimbledon in October and Lewisham (Beaumont), Kew Gardens (G. Nicholson), Tooting on ivy blossom in autumn of 1898 (Sparke), Norbury at end of September (South), Hampstead Heath (Image), Felden in Herts (Piffard), Knowle near Birmingham (W. Ellis), at oil lamp in Ipswich at end of May (Platten), Tostock in November, 1903 (Tuck), Sherringham in Norfolk (Tonge), South Leverton in Notts during September and Scotton Common in Lincs (Thornley), Lincoln, a male on gas lamp in October, 1900 (Musham). I first took it at Shooters Hill near Blackheath in 1889; only once on an incandescent street lamp in Ipswich on 28th October; early in June, 1903, Chitty netted it flying to leaves of an oak at Brandon; and it has twice come to light about 9 p.m. at Monk Soham in May and June, in the course of seven years; I noticed that when the last specimen was about to fly it raised its front legs high in the air, stood as high as possible upon its posterior tarsi and flapped its wings with a sudden jerk, which precipitated it but a short distance into the air. The only bred example I have seen, besides Lyle's, was received from Slater, bred from a peculiarly woolly cocoon—rougher than is figured by Bridg.-Fitch—"which emerged from *Leucania straminea* at Doncaster; the imago died at the end of April, 1909, but was still soft" when received on the 7th May.

Records are from Sparham in Norfolk and bred from *Agrotis tritici* (Bridg. Norf. Soc. 1894, p. 617); Bickleigh in Devon on 14th June (Bignell), Yorkshire, "common through county" (Trans. Yorks. Nat. Union, 1878, p. 69); Co. Armagh (Johnson, Irish Nat. 1904, p. 256). It has been bred in Britain from *Dicranura vinula* (Eedle, Entom. xiii, p. 68), *Arge galatea* (Raynor, Entom. xvii, p. 179), and by Bignell from *Hadena protea* and *Epunda lichenea* (Bridg.-Fitch, l.c. 1884, p. 179). The Continental naturalists have raised it from *Sesia formiciformis*, *Pseudopterpna cytisaria* and *Agrotis porphyrea* (Brischke), *Bombyx pini*, *Hybernia aurantiaria*—cf. *Ophion minutus*, infra—and *Pachetra leucophaea* (Ratzeburg), *Acronycta leporina* (Drewsen), *Episema scoricea*, Esp. and *Polysphaenis sericata*, Bkh. (Mocsáry). Schmiedeknecht considers it widely spread but rarer than *O. luteus*. In the New Forest, Lyle tells me that its larva usually emerges from that of its host in the middle of May, thus the larva deserted that of *Triphaena fimbria* on 10th May, 1902, but did not attain the perfect state till the following April; a forced female was bred from the same host at the end of February, 1911; and a larva that emerged from the caterpillar of *Noctua neglecta* in May, 1903, did not attain the perfect state till 14th April, 1904.

13. *minutus*, Kriech.

Ophion minutus, Kriech. Ent. Nachr. 1879, p. 105; Thoms. O.E. xii. 1192; Brauns, Arch. Nat. Meckl. 1889, p. 91, ♂ ♀.

Extremely like *O. obscurus* in its profuse flavidous markings, but abundantly distinct therefrom and closely related to *O. parvulus* (of which it is probably a mere colour variety) in having the nervellus strongly postfurcal, the distance from the nervelet to median nervure no longer than is the second recurrent nervure, and in lacking all trace of basal metanotal transcarina. Length, 8–12 mm.

A species, in spite of Bridg.-Fitch's remarks to the contrary, fully as rare as *O. parvulus*, with which a male occurred to me in the New Forest near Brockenhurst in the middle of May, 1895. A female was first taken in Britain by Bignell at Laira in Devon on 4th June, 1878 (Bridgman, Entom. 1880, p. 54) and again at Bickleigh on 6th and 10th June, 1898; the latter found it at Norwich; T. Wilson flying along a hedge-row near York (Yorks. Nat. 1881, p. 153) and Savage records it from Fairlight near Hastings in 1880 (E.M.M. xvii, p. 236). Again on 20th May, 1911, I beat a male from oak at Palmer's Heath near Brandon in Suffolk; and Mr. R. South has been so good as to give me a female, bred about the 7th May, 1902, from *Hybernia aurantiaria* in London. The cocoon of the last is 9 mm. in length, dull brown with a dirty stramineous central band and no iridescent reflection. Sweden (Thomson), Belgium (Tosquinet), France (Gaulle); wide spread in Europe, though mostly rare (Schm.); but Vollenhoven's record from Holland, with his rearing from *Noctua cruda* and *Pyrallis forficalis* (Pinac. 62) must, judging by his erroneous figure, be referred to *O. obscurus*, as was pointed out by Bridgman in 1880.

14. *ventricosus*, Grav.

Ophion ventricosus, Gr. I.E. iii. 702; Curt. B.E. pl. 600; Zett. I.L. i. 392; Holmgr. Sv. Ak. Handl. 1858, p. 12; Tasch. Zeits. Ges. Nat. 1875, p. 432, Thoms. O.E. xii. 1192; Brauns, Arch. Nat. Meckl. 1889, p. 92, ♂ ♀.

A strongly punctate, stout, rufescent testaceous species with usually a central facial line, frons and occiput, ocellar and scutellar regions, metanotum, sternal marks, hind coxae and ♀ anus, black. Head posteriorly as broad as eyes. Antennae as long as body and somewhat stout. Metanotum usually strongly carinate, discally coriaceous and dull, with the small areola distinct and glittering; petiolar area concave and coarsely punctate, with stout apophyses. Scutellum subcarinate laterally. Wings always strongly flavescent; nervelet short or wanting; lower basal nervure continuous, subante- or subpostfurcal; nervellus postfurcal and centrally intercepted. Length, 14–16 mm.

An extremely distinct species.

Gravenhorst knew this insect from several central European localities in June, but his largest example was sent by Hope, from Netley in Shropshire; this was of 7½ lines or 16 mm., than which I have seen none larger, though Schm. tells us it extends to 20 mm. Holmgren says it is uncommon in Swedish woods at the end of May; but Vollenhoven's plate xxviii, fig. 3, is misnamed; Schm. considers it one of the commonest European species, and Tosquinet records it from Beersel and Gaud in

Belgium during May, while Gaulle says it has been found in France and Kirchner bred it from *Bombyx Milhauseri*. Giraud raised it from *Callimorpha dominula* (Ann. Soc. Fr. 1877, p. 406), probably in Austria. It was known as British to Curtis and Desvignes; and Marshall gives it (Ent. Ann. 1874, p. 124) as bred by him from *Bombyx quercus*, L. It is, however, extremely local with us and nearly confined in my experience to the New Forest, whence Miss Chawner has kindly given me four examples and Mr. Adams two, both from his Lyndhurst garden on 20th May, 1901, and 2nd June, 1907. While strolling through Briken Wood there on 10th June, 1911, I was so fortunate as to net a beautiful female, hovering in the sunshine about some scattered bushes in a glade. Elsewhere I have received for determination a single male, taken in Pelham Wood in Lincs., by F. W. Sowerby during June, 1909; a single example caught by W. Ollis about Hastings on May 5th, 1907; and I possess one in Capron's collection, possibly from Surrey.

15. *marginatus*, Jurine.

Anomalon marginatum, Jur. Nouv. Méth. 1807, 116, pl. viii, fig. 2a. *Ophion marginatum*, Gr. Nov. Act. Acad. Nat. Cur. 1818, p. 296. *Ophion marginatus*, Gr. I.E. iii. 704; Curt. B.E. pl. 600; Guérin, Icon. Regn. Anim. vii, 1845, 409, pl. lxx, fig. 6; Tasch. Zeits. Ges. Nat. 1875, p. 428; Brisch. Schr. Nat. Ges. Danz. 1880, p. 135; Thoms. O.E. xii. 1193, ♂ ♀. *Eremotylus marginatus*, Brauns, Arch. Nat. Meckl. 1889, p. 98; Schm. Opusc. Ichn. ♂ ♀.

A piceous-red species, profusely black-marked. Head closely punctate, with temples as broad as eyes and vertex elongate. Antennae fulvous, slightly longer than body and not slender. Thorax closely punctate, with the scutellar region and sutures black; notauli subobsolete; metathorax short, its notum abruptly declived beyond the centrally sharply elevated basal transcarina, irregularly rugose with no discreted posterior central area; sides of mesosternum with an acute apical tubercle. Scutellum acutely carinate laterally. Abdomen extensively nigrescent, often only discally rufescent before the base, petiole and anus usually black; generally with petiolar base and hyperstylus, the nodose second segment at base and apex black; petiolar membrane hardly reaching centre; terebra black and hardly exerted. Hind coxae black-marked, or apices of all coxae and base of trochanters black. Wings strongly flavescent with stigma, costa, tegulae and radices fulvous; nervelet wanting; lower basal nervure a little antefurcal, the upper parallel with brachial cell which is not convergent with it; radius simply and abruptly curved, and incrassate, at its base; nervellus intercepted somewhat below its centre. Length, 18–20 mm.

Similar to *O. ventricosus* in conformation and the infumate-testaceous wings, but larger (Thoms.), with antennae a little longer (Grav.); though distinct from all the preceding species in its nodulose basal segments, and the both curved and incrassate radial base. The parallel brachial nervure and lack of nervelet instantly distinguish it from *O. longigena*, which appears to connect this and the last species with the more typical ones of this genus.

Distributed over the greater part of Europe, but always scarce; singly in Thuringia (Schm.) and Lund (Thoms.); Germany and Hungary (Grav.); Vienna (Kirchner); and bred in France from *Scopelosoma satel-*

litia (Gaulle). It is, however, unknown in Holland and Belgium; and I can find no British notes of captures, though in all our Catalogues since Curtis' time; the seven examples in Mus. Brit. are correctly named, but without localities.

16. *bombycivorus*, Grav.

Ophion bombycivorus, Gr. I.E. iii. 705, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 135; Bridg.-Fitch, Entom. 1884, p. 178, ♂ ♀. *Stauropoctonus bombycivorus*, Brauns, Arch. Nat. Meckl. 1889, p. 94; Schm. Opusc. Ich. ♂ ♀.

Ochraceous, with more or less extensive black markings. Head usually with only occiput and an ocellar mark black; ocelli large and occupying whole of the very short vertex. Antennae distinctly longer than body, fulvous with their basal third black. Thorax with no notauli; mesonotum usually with three often confluent discal vittae, with variable sternal and metanotal marks, black; metanotum nearly smooth before the strongly elevated basal transcarina, thence extremely strongly multicarinate to the obviously produced apex. Scutellum coarsely punctate and only basally carinate. Abdomen partly black; two basal segments linear with apex of first nodose and apical half of second rounded. Legs slender, usually with hind femora and more or less of hind coxae black. Wings subinfumate and narrow, with costa black and the fulvous stigma sublinear; radial nervure simply and abruptly curved, and incrassate, basally with a glabrous area below base of stigma containing no corneous marks; nervelet wanting; the subsinuate brachial nervure subparallel with upper basal; nervellus intercepted above its centre. Length, 9–10 lines (Grav.) or 24–26 mm. (Brit.).

Rare and local in central Europe; probably coextensive with its only known host. The type was bred at Breslau “c pupa *Bombycis fagi*” by Gravenhorst, who received a second female from Hanover; Desvignes says Mr. B. Standish also bred it in Britain and Brischke raised both sexes in Prussia from larvae of the same Lepidopteron; Norgate had the same experience (Bridg.-Fitch). But it is certainly very rare with us and I have heard of no captures in the field. Its irregularly cylindrical, shining, and castaneous-black cocoon, which Brauns describes as elliptic, bronze, rugose with a shaggy outer covering, is poorly figured at Entom. xvii, pl. ii, fig 10, from the New Forest; its envelope, as Bridg.-Fitch say, “appears to project out of the cylindrical shape of the inner one; it measures eight lines by five; there are but a very few silky hairs on the cocoon.” It is recorded from France by Dours, but from neither Belgium nor Sweden, I have an unlocalised female from Beaumont's collection and another bred by Chitty in 1893; probably all the British records are from the New Forest, whence Mr. Blair kindly sent me a male, together with its cocoon and outer envelope, having removed the surrounding beech-leaves, remarking that it had emerged on the 7th June, 1906, from a larva of *Stauropus fagi*: “the larval skin of the host, thoroughly cleaned out, was rammed down to the hinder end of the cocoon.” All but the type seem to have demolished their host before it pupated, which goes to disprove Edwin Birchall's tentative assumption (E.M.M. 1877, p. 232) that the very striking attitude assumed by the Lobster Moth caterpillar while feeding is in order to render it inconspicuous to ichneumons.

17. *undulatus*, Grav.

Ophion undulatus, Gr. I.E. iii. 697; Holmgr. Sv. Ak. Handl. 1858, p. 12; Voll. Pinac. pl. xxviii, fig. 4, ♂ ♀. *O. undulatum*, Magretti, Naturaliste, 1889, p. 84. *Enicospilis (Allocamptus) undulatus*, Thoms. O.E. xii. 1189, cf. xix. 2120. *Allocamptus undulatus*, Brauns, Arch. Nat. Meckl. 1889, p. 97. *Cynatoneura undulata*, Schm. Opusc. Ichn. ♂ ♀. Var. *O. inflexus*, Ratz. Ichn. d. Forst. i. 102; iii. 80; Voll. Pinac. pl. xxxix, fig. 4; Brisch. Schr. Nat. Ges. Danz. 1880, p. 135, ♂ ♀.

A large testaceous species with no black markings, very like the *O. luteus* group but with the radius bisinuate (first deltexed, then reflexed) below the linear stigma and above a glabrous area, nervelet wanting, nervellus antefurcal and intercepted far below its centre, head posteriorly buccate, scutellum strongly carinate to apex on either side, the metathorax strongly transcostate and declived from basal transcarina, and the postpetiole nodose. Antennae about length of body, of ♂ 66- and of ♀ 63-jointed. Length, 23-30 mm.

I consider Gaulle quite correct in confirming Brischke's queried synonymy of Ratzeburg's species here; Vollenhoven's figure shows the radius slightly less sinuate than in the type, not an uncommon British form, but I fail to find in any the minute corneous dot introduced in his plate of 1879. A single ♀ was originally bred by Graff from a cocoon of *Gastrophysa lanstris* and later Brischke raised it from larvae of the same moth.

This species is common neither here nor upon the Continent. Germany, Piedmont and a female bred from larva of *Bombyx trifolii* (Grav.); Sweden, a single pair of only six lines in length (Holmgr.); France (Gaulle); Belgium in June, July and August (Tosquinet); Brunelvas in July, 1900, by Dr. Chapman (in coll. Morley); Jerusalem (Schm.). I find no localised records, and the single example in Bridgman's collection has strongly flavescent wings. It appears very rare and most of my specimens were bred; but two, taken at Bonhill by Malloch and at Glenmallon in 1897 by Dalglish, seem to have been taken in the field. Waterston raised a female of the maximum size from *Bombyx quercus* in Scotland on 17th June, 1899, the cocoon of its host is 30 mm. in length and its own, placed somewhat obliquely within it in order to leave room for the empty host-larva skin which is pushed to the inner extremity, is 25 mm. in length; Peachell raised a female from the same host at Weymouth on 20th March, 1901 (probably "forced"); South gave me a male from *Odonestis potatoaria* near London in 1902; and Clutten sent me a pair from Barmouth *Bombyx callunae* in 1906.

Abroad it is recorded from *Chaerocampa elpenor* and a species of *Macroglossa* (Gaulle), *Bombyx trifolii*, *catax*, *rubi*, *everia* and *quercus* (Giraud, Ann. Soc. Fr. 1877, etc.), *B. quercus* var. *sparti* (Bellier de la Chavignerie) and *Lasiocampa tremulifolia*, Hbn., (Mocsáry). Taschenberg must have mixed this with one of the North American species in recording it (Zeits. Ges. Nat. 1875, p. 430) from *Samia cecropia*; and Harrach's observation of two specimens emerging from a single pupa of the small *Taeniocampa gothica* (doubly queried by Bridg.-Fitch, Entom. 1884) is absurd, for it never emerges from its host's *chrysalis* at all.

HENICOSPILUS, Stephens.

Enicospilus, Ste. Illus. Man. vii. 126; *Allocamptus*, Först. Verh. pr. Rheinl. 1868, p. 150 (*nec* Thoms.).

A genus of large testaceous insects, with at most the anus and part of thorax black. It has usually been considered an artificial division of *Ophion*, but the following constant characters render it very distinct. Antennae more slender; much narrower lower discoidal cell; basally sinuate base of basal, and basally distinctly curved base of apical, abscissa of radial nervure; the more slender mandibles with their upper tooth the longer and subacuminate; and especially the absolutely glabrous and transparent area of the disco-cubital cell immediately below the stigma, which area in our species bears one or two corneous spots.

We possess four of the six European species of this genus, all of which are by no means improbably but forms of the same; the wing nervures vary slightly at the junction of the basal with the median nervure and below the stigma, the density of the corneous alar marks is instable, and we have nothing but the extent of nigrescent colouration to fall back upon, for I fail to note any distinction in the apical antennal attenuation, referred to by Holmgren.

Table of Species.

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|------|---|-------------------------------|
| (2). | 1. Lower mandibular tooth nearly as long as upper; glabrous alar area with but one corneous mark .. | 1. REPENTINUS, <i>Holmgr.</i> |
| (1). | 2. Lower mandibular tooth two-thirds length of upper; glabrous alar area with two corneous marks. | |
| (6). | 3. Thorax entirely testaceous, not nigrescent beneath. | |
| (5). | 4. Anus broadly black on the apical segments | 2. RAMIDULUS, <i>Linn.</i> |
| (4). | 5. Anus not broadly black on apical segments | 3. MERDARIUS, <i>Grav.</i> |
| (3). | 6. Thorax always nigrescent below and often discally also | 4. COMBUSTUS, <i>Grav.</i> |

1. *repentinus*, *Holmgr.*

Ophion repentinus, Holmgr. Sv. Ak. Handl. 1858, p. 11, ♂ ♀; Voll. Pinac. pl. xxxix, figg. 6, 6a. *Henicospilus repentinus*, Bridg.-Fitch, Entom. 1884, p. 177, ♂ ♀. *Enicospilus repentinus*, Thoms. O.E. xii. 1189; Brauns, Arch. Nat. Meckl. 1889, p. 96. Var. *Ophion repentinus*, Voll. Pinac. pl. xxviii, fig. 7; *O. Tournieri*, Voll. l.c. p. 61; *Enicospilus Tournieri*, Brauns. Arch. Nat. Meckl. 1889, p. 96, ♂.

Testaceous, with the head partly flavidous and in ♂ a little dilated behind the eyes, which with ocelli are black. Antennae as long as body. Abdomen slightly infusate apically on either side. Tarsal claws distinctly pectinate. Glabrous alar area with but a single corneous and subtriangular mark; radial nervure basally incrassate; nervellus intercepted below its centre. Length, 16–20 mm.

Holmgren says that the space between the eyes and ocelli is fully twice broader than in *H. ramidulus*, but in my examples it is equally obsolete

in both. Vollenhoven's variety differs in having the petiolar area somewhat striate and the basal nervure not continuous through the median.

It was originally described from Swedish specimens, captured in the middle of July, and appears to be everywhere rare in north-west Europe, extending to France; but has been nowhere yet bred. The variety is a Swiss form, not yet known to occur with us. This is the only species of its genus considered to be rare by Bridgman, in whose Norwich collection is a single specimen with the lower apical margin of the glabrous alar area narrowly corneous flavidous, as it also is in the only example I possess, a female received in 1901 from Rev. H. S. Gorham.

2. *ramidulus*, Linn.

Ichneumon ramidulus, Linn. S.N. 1758, 566; Berkenhout, Nat. Hist. Brit. 1769, 166; Schr. En. 1781, 372; Fab. E.S. 1793, 178; Schr. F.B. ii. 263. *Sphex truncata*, Poda, Ins. Graec. 1761, 107; Scop. Ent. Carn. 290, pl. xl, fig. 768. *Ophion ramidulus*, Fab. E.S. 1798, 236; Piez. 131; Gr. I.E. iii. 399; Curt. B.E. fol. 600. *Anomalon ramidulum*, Jur. Nouv. Méth. 116. *Enicospilus ramidulus*, Ste. Illus. Man. Suppl. 3; Thoms. O.E. xii. 1188; Brauns, Arch. Nat. Meckl. 1889, p. 96, ♂ ♀. *Henicospilus ramidulus*, Bridg.-Fitch, Entom. 1884, p. 177.

Head constricted behind the eyes, which are subcontiguous with ocelli; cheeks subconstricted and not very short; facial orbits pale flavous. Thorax immaculate; notauli wanting, epicnemial bisinuate, mesosternum very coarsely punctate, speculum not smooth; metathorax closely punctate, not strigose nor excavate towards its apex, with the basal transearinal strong. Scutellum with its apical declivity immarginate. Abdomen with segments five to eight entirely black. Wings hyaline, nervures pale; stigma narrow and flavous, emitting the basally incassate and subsinuate radius from its basal fourth; lower basal nervure usually a little antefurcal; brachial cell subdilated apically, with its upper margin not curved; fenestra of second recurrent nervure not extending to centre; nervellus intercepted below its centre and not antefurcal. Length, 16–22 mm.

Instantly known by the deep black anus.

It is not an unusual species in northern European woods, extending to France; and has frequently been bred: from *Puccinellia populi* by Rondani, *Bombyx pini* by Dours, *Eriogaster lanestris* by Scopoli, *Dipterygia pinastri* by Drewsen, *Trachea piniperda* by Hartig, Giraud, Brischke and Norgate (Entom. 1883, p. 95), *Diantheria capsicola* by Giraud, and from *Hadena pisi* by Gravenhorst and in south Devon on 26th June by Bignell. In Britain it has been recognised since 1709, when it was described by Berkenhout, and the figure of it in Donovan's Nat. Hist. Brit. Ins. ii (1703) is passable. It is, however, distinctly local, and I never found it about Ipswich during ten years' collecting. It occurs singly in the New Forest, where I have seen it flying slowly over long grass and reeds in Matley Bog during August; but at Southwold on the Suffolk coast it was common in September, 1907, along with the next species; I first took it there at light in a house at 11.30 p.m. on 25th July, 1900. Elliott and I have swept it in Tuddenham Fen late in August, and Chitty took it at Brandon on reeds in 1906. Norgate records it (E.M.M. xvi, p. 182) from Tresco in the Scilly Isles during August, 1878; and Bridgman from the Heigham Osier Carr in Norfolk. I have examples from Harting in Sussex and Woking (Beaumont); Loo Bridge in July (Andrews); Purbeck

in Dorset in July (Bankes); and on 13th September, 1908, Clutten sent one of its cocoons which had just emerged from *Agrotis praecox* from St. Annes, whence the imago appeared the next year. It would seem commoner on the coast sand-hills and salt-marshes than inland.

3. *merdarius*, Grav.

Ophion merdarius, Gr. I.E. iii. 698; Curt. B.E. fol. 600; Ratz. Ichn. d. Forst. i. 101; Holmgr. Sv. Ak. Handl. 1858, p. 11; Tasch. Zeits. Ges. Nat. 1875, p. 435; Voll. Pinac. pl. xxviii, fig. 5. *Henicospilus merdarius*, Bridg.-Fitch, Entom. 1884, p. 177; Bignell, l.c. 1887, p. 19. *Enicospilus merdarius*, Thoms. O.E. xii. 1188; Brauns, Arch. Nat. Meckl. 1889, p. 96.

Testaceous, with two corneous alar marks and the anus at most slightly subinfusate. Length, 16–23 mm.

So like the last species that I consider it distinct from habit rather than conviction; the sole distinction is that the anus is not determinately black. Thomson says the cheeks are shorter and less constricted, which I fail to find in my seventy examples of the two kinds; Schm. remarks that the body is as a rule stouter with the antennae longer, which is not evident.

A common species throughout Europe and frequently bred: from *Simyra nervosa* by Mocsáry, *Trachea piniperda* by Ratz., *Dianthecia irregularis* by Brischke, *D. albimacula* by Mocsáry, *Hecatera dysodea* by Perris, teste Giraud, *Cucullia argentea* by Brischke, *C. chrysanthemi* by Mocsáry, *Grammodes algira* and *Pseudophia tirrhaca* by Kriechbaumer, and doubtfully from *Samia cecropia* by Tasch.; Dours' record from *Lophyrus pini* is doubtless an error. I have not found it quite so widely spread in Britain as the last species (or form), with which it occurred freely in the salt marshes and adjacent beach at Southwold during the first half of September, 1907; numbers were seen flying about the marram and other grasses and easily captured in one's fingers; it also came to light in the town at midnight on 24th and 31st July, 1900. I have a long series bred at Bury St. Edmunds and Tuddenham from *Dianthecia irregularis*, with two females raised during 1902 from *Anticlea sinuata* at the latter locality by Tuck, who sent me a female from Tostock Fen on 8th September, 1900, with the note: "I am certain that this *Ophion* stung me rather severely." It has been bred in Devon on 25th July and 3rd August by Bignell from *Hecatera serena* and by Norgate at Norwich from *Trachea piniperda*, teste Bridg.; I have it from Felden (Piffard); Shere (Capron); Deal, August, 1890 (Porritt); Brockenhurst, August (Cross); Tooting, Surrey (Sparke); Clevedon near Bristol (Charbonnier); Bonhill 6th July and Barr in Ayrshire (Dalglish); but the only June capture was effected by Elliott, who took it on the 19th in Tuddenham Fen.

4. *combustus*, Grav.

Ophion combustus, Gr. I.E. iii. 701, ♂; Stuvely, Trans. Linn. Soc. xxiii, 1, 1860, pl. xvi, fig. 18. *Enicospilus combustus*, Ste. Ill. M. Suppl. 3, pl. xl, fig. 4, ♂; Brauns, Arch. Nat. Meckl. 1889, p. 96. *Henicospilus combustus*, Bridg.-Fitch, Entom. 1884, p. 176, ♂ ♀.

Testaceous. Head anteriorly more or less broadly flavidous. Thorax at least beneath nigrescent, if also discally the apex of metathorax and sutures, frenum and scutellum are usually testaceous. Abdomen with

anus, and sometimes the basal segment discally, black. Legs rufescent-or piceous-flavidous. Wings flavescens clouded, with two corneous marks in the glabrous area; stigma and tegulae rufescent. Length, 18-20 mm.

Distinct from the two last species in nothing but the nigrescent thorax.

This seems to be a very rare form of the preceding species, since Gravenhorst knew but a single male, taken by Sturm at Nuremberg, Gaulle gives it as bred from *Catocala nupta* in France, and it is unknown in Sweden. Schm. records it as a rare central European species; and Tosquinet says it occurs during August and September in Belgium. Bridgman and Fitch, however, considered that "it is not rare in Britain" and Stephens' figure is excellent, but I can find no mention of an indigenous capture. The only example I possess was acquired from the collection of the late J. A. Clark, who had no foreign Ichneumonidae. Desvignes' and Stephens' examples are in Mus. Brit. with three from Marshall's collection, one of which he bred in 1886 at Nunton in Wilts.

TRIBE

PANISCIDES.

A Tribe of flavidous or rufescent species, usually of somewhat large size. Thorax nitidulous and never strongly sculptured; notauli distinct, but rarely deeply impressed; metathorax subdeclived throughout, and not apically produced above hind coxae. Abdomen slender and not deplanate; basal segment elongate and subparallel-sided, rarely subpetiolate or subsessile, with the spiracles always before its centre and lateral sulci of unique conformation (termed by some modern authors, *glynmae*); terebra shortly exerted or subconcealed, ♂ valvulae large and strongly exerted. Tarsal claws strongly pectinate; intermediate tibiae distinctly bicalcarate. Wings very ample; areolet in our indigenous species never wanting, usually triangular, with the nervures subentire (the external often fenestrate below) and always coalescent above, emitting the external abscissa of the radius in a strong curve, which basally forms an acute angle with the internal abscissa of radius and is exactly continuous with the inner nervure of areolet; stigma never broad nor triangular, often pale; nervellus intercepted above, very rarely at or below, its centre. In all our genera, this group may be known by having the external radius continuous at the base with the inner submarginal nervure.

With us it is a small group, comprising only a few common and ubiquitous species, whose frequency renders a knowledge of their distinctions more necessary than we have been inclined to hitherto consider it in this country, where are but three well-defined genera. In my attempted "Revision" of the world's species, it was found necessary to allot them only five genera (the inclusion of *Westwoodia* here was solely for the sake of the remarks attached to it) and I considered *Parabatus* distinct; that it is so is still open to doubt, and the slight divergence is insufficient to warrant its retention in our fauna.

Table of Genera.

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|---|--------------------------|
| (2). 1. Cheeks and temples buccate; scutellum convex and not carinate .. | OPHELTES, <i>Holmgr.</i> |
| (1). 2. Cheeks and temples normal; scutellum normal and basally carinate laterally. | |
| (4). 3. Head strongly constricted behind; mandibular teeth equal | PANISCUS, <i>Schr.</i> |
| (3). 4. Head hardly constricted; lower mandibular tooth the longer | ABSURTUS, <i>Holmgr.</i> |

OPHELTES, *Holmgren.*

Holmgr. Sv. Ak. Handl. 1858, p. 30; Ofv. 1858, p. 323.

Head strongly buccate, very broad behind eyes, with vertex broad; mandibles somewhat broad, with teeth of equal length; palpi with three apical joints filiform; eyes not large, oblong-oval and slightly emarginate next the scrobes; ocelli of normal size; cheeks broad. Antennae filiform and slender; scape not apically excised. Thorax stout, with pleurae

linearly transimpressed; metathorax deeply impressed basally with elongate spiracles and distinct areae, of which the areola is strongly elongate and laterally strongly carinate; petiolar area short and small; apophyses dentiform and somewhat strong. Scutellum not laterally carinate. Abdomen petiolate and compressed; basal segment straight, with spiracles a little before centre and lateral basal sulci deeply impressed. Legs slender; tarsal claws somewhat large and stoutly pectinate. Wings subample with areolet complete, small and triangular, emitting recurrent nervure from its apical angle; stigma very narrow, emitting radius almost from its base; apical abscissa of radius distinctly, though slightly, curved above areolet; nervellus intercepted above centre.

A Tenthredinid parasite appears anachronous in the present group, with which this genus is too naturally related to be relegated to the Tryphonini, yet there is a good deal of analogy with *Scolobates* in its structure, especially that of the head.

1. *glaucopterus*, Linn.

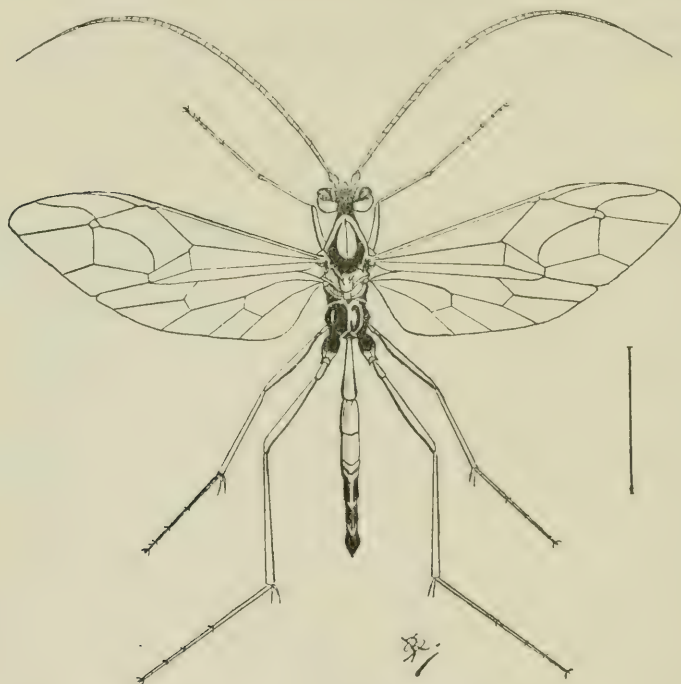
Ichneumon glaucopterus, Linn. S.N. 1758, 566; F.S. 1761, 407; Panz. Schaeff. Icon. 1767, pl. lxxxii, fig. 3; Dale, Trans. Ent. Soc. 1871, Proc. xxiv. *I. ramidulus*, Fourc. E.P. 1785, 400. *I. pteromelas*, Vill. Linn. Ent. iii. 196; Oliv. Encyl. Méth. vii. 217. *Ophion glaucopterus*, Fab. E.S. Suppl. 1798, 236; Piez. 133. *Paniscus glaucopterus*, Gr. I.E. iii. 633; Ratz. Ichn. d. Forst. i. 100; Gray, Ann. Nat. Hist. v. 1860, p. 339, ♀; Tasch. Hym. Deut. 1866, 71, ♂ ♀. *Opheltes glaucopterus*, Holmgr. Sv. Ak. Handl. 1858, p. 30, ♀; Bridg. Entom. 1879, p. 55, ♂. *Campoplex flavipennis*, Provan. Nat. Canad. 1874, p. 143; cf. *lib. cit.* 1879, p. 145, fig. 6a et Canad. Entom. 1887, p. 80.

A large rufescent-testaceous species with the anus, and more or less of the thorax, black. Head extremely broad behind the eyes, with frons and ocellar region and apex of occiput black. Antennae apically nigrescent. Metathorax finely punctate with variable but usually very strong carinae; areola sublinear, not extending to base, with its apical costa strongly reflexed. Abdomen slender and nitidulous, pale with anus from apex of fourth segment deep black and terebra testaceous. Legs immaculate or with the coxae basally black. Wings strongly flavescens and apically slightly infumate; stigma clear red and nervures piceous. Length, 20-22 (or abroad, -26) mm.

Very widely distributed; it is said to occur on umbels in August, and in June in Germany where it has been often captured at light, and seen flying round alders as late as October; Sweden in August; France; Holland in August; Italy; I have females taken by Montandon at Bucharest and Dobrudja in Roumania, together with a single example of the undescribed male of the southern var. *fuscipennis* (Gr. I.E. iii. 635, ♀), which differs in nothing but its anal appendages from its female, and both from the type form only in their deeply infumate wings. It has long been known to be parasitic upon species of the Tenthredinid genus *Cimbex*: bred from *C. variabilis* (= *femorata*) by Hartig (Jahresb. 68); 20th May, 1832, by Drewsen (Weigm. Arch. ii, p. 38) and a ♀ on 30th May, 1849, by Brischke (Ratz. iii. 80); by Giraud both from that species and *Cimbex axillaris* (= *humeralis*) (Ann. Soc. Fr. 1877, p. 406); Siebold raised it from eggs deposited in *C. connata* by a virgin mother (Jent. Nachr. 1884,

p. 95) and Mocsáry from *C. lutea*, while Provancher bred it in Canada from *C. Americana*, Leach.*

This species is by no means common in Britain, since none of its host-genus are of at all frequent occurrence; and the male was almost unknown in 1885, though Bridgman—overlooking Taschenberg's description—wrote of it (Entom. 1879, p. 55) "The only difference I can detect is that the prothorax, except the sides, pleuræ and metathorax are black, also a longitudinal streak of the same colour on the middle lobe of the mesothorax"; this male is in the Norwich Museum, but the distinction is not sexual, since the thorax is very variable in the extent of its nigrescence. There are but few indigenous records: Bridgman took a single



female at Brundall in Norfolk; Porritt recorded it from Meltham Mills, Huddersfield in the Naturalist, 1902, p. 163; and there is a—possibly local—female in the Hastings Museum. I have several specimens, including both sexes, taken by Chitty at Forres during September, 1892; and an old male from Beaumont's collection, captured by Wratislaw many years ago, near "Bury St. Edmunds," probably Tuddenham Fen, where I beat a single female on 27th August, 1906, from a birch bush in a dry situation. These were probably from the birch-feeding *Cimbex femorata*, since I find *O. glaucopterus* recorded in the Pagets' "Nat. Hist. of Yarmouth": "From Chrysalis of *Cimbex varians*," Leach, whose larvae they say were common on birches in Lound Wood, near Lowestoft, in September.

The Rev. J. G. Wood's reference to *Paniscus glaucopterus* (Strange Dwellings, 1890, 294) from the Puss Moth is, of course, a slip for *P. cephalotes*, as the cocoon shows.

PANISCUS, Schrank.

Schr. F.B. ii. (1802), 316.*

Colour mainly testaceous. Head of variable shape, with eyes large, black and emarginate next the scrobes; ocelli of variable size, small and central or large and occupying whole vertex; cheeks short or absent; mandibles weak, with upper tooth much the longer; palpi elongate; clypeus more or less deeply discreted; occipital costa often wanting. Antennae setaceous or subfiliform, always slender and rarely longer than body; scape excised, pedicellus not small, annellus distinct. Thorax somewhat short and sometimes slender; notauli entire or apical, rarely deeply impressed; metathorax short and finely transaciculate, with circular or oval spiracles; basal transcarina always wanting, the apical usually more or less distinct laterally near the obsolete apophyses. Scutellum laterally carinate, throughout or to centre or only at base. Abdomen somewhat strongly compressed apically in ♀; basal segment not laterally margined with deeply impressed basal lateral foveae or sulci, its spiracles at the apical third; terebra as long as basal segment or not longer than anal breadth. Legs slender and not short; tibiae externally sparsely spinulose; calcaria elongate and unequal in length; claws densely pectinate, not small and longer than pulvilli. Wings large and hyaline with stigma conspicuous and not narrow; areolet nearly always entire, narrowly triangular, emitting the bifenestrate recurrent nerve from its apex; apical abscissa of radius basally strongly curved and subcontinuous with inner nerve of areolet; nervelet obsolete or wanting; upper basal nervure nearly straight; the lower continuous, slightly antefurcal or strongly postfurcal; nervellus intercepted above its centre.

As Bridg.-Fitch truly say "the species of *Paniscus* are amongst the commonest of our Ichneumons, but they are rather difficult to distinguish; they bear considerable resemblance to the species of *Ophion* in many respects, but the neuration will at once distinguish them." This resemblance, however, is as Schm. points out, rather one of colour than of structure; he remarks upon certain analogy with *Perilissus* (which is superficial), as well as with both the *Mesochorini* and *Banchini*, between which there can be no doubt is their most natural location and the late period at which this fact has been demonstrated must be assigned to the exotic and oriental distribution of the connecting genera, with which I was not acquainted when compiling the third volume of Ichn. Brit.

The peculiar and interesting ectoparasitism of the present genus has rendered its economy so easy of observation that we have a great number of important facts recorded respecting its habits in all stages of growth.

Herr Pfankuch informs me (*in lit.* 1913, and I have since confirmed the statement) that Schrank terms this genus *Paniscus*, or Wehrwolf, in the margin of the page cited (*cf.* "Revision," ii. 102).

In working through this genus, I discovered a good many examples of *Trionopoda stictica* (Ichn. Brit. iv. 274) mixed therein and quite overlooked among my previous records, to which add:—Lyndhurst in May and July (Adams), Nampton in west Suffolk (Nurse), Hastings (Essex), Felden (Pitard), Leigh near Bristol in June (Charbonnier), and South Leverton in Notts (Thorntley). It occurs sparingly about bushes in woody places in company with *Paniscus latungula*, from the middle of May to early July, when I have taken it—once attracted by *Cossus*-borings in an oak tree—at the Bentley Woods and Hensstead in Suffolk. The pectinate tarsi, general conformation, alar neuration and testaceous colour render it extremely like *Paniscus*, from which it is best distinguished by the distinctly curved upper basal nervure and subcubical head. The lower basal nervure varies from elongately postfurcal to subcontinuous with the upper; the areolet differs little in shape, but the external radial nervure is basally straighter and claws smaller.

Most of these have been inserted under the respective species; but one or two must—as in the case *Ephialtes*—be placed generically for lack of specification. Miss Clara Kingsford (Entom. 1883, p. 69) found a caterpillar of *Acronycta psi* beneath lime trees on August 24th, bearing two chocolate-brown eggs of unequal size on its left side between head and horn. On 26th the larger was expanded and part was white; it enlarged thence to 29th, when it appeared like an elongated and pedunculated bladder, firmly attached to the caterpillar; this bladder was the parasitic larva, segmented, transparent white, with white tree-like opaque markings, gradually darkening interiorly. It continued to grow till 31st, when it was a quarter-inch long, forming an arch over the back of the caterpillar, which ineffectually attempted to dislodge it. On 1st September the host had become very torpid and lost its colouring; by the 2nd the larva was nearly opaque white and at three p.m. when it deserted its just-dead host, was half-an-inch in length, apodous, progressing slightly and unwieldily by propulsion of the anus. On 3rd it had still increased in size, but was less lively; and on 6th had changed from cream colour to bright yellow. On October 12th it began to darken, and subsequently died in the act of cocoon-spinning. Fitch says “there can be little doubt” that this was *P. cephalotes*; but the evidence is too slender, though the facts are so carefully observed as to be worth perpetuating.

An even less definite experience befel me: I swept a larva (of ? *Plusia gamma*) from bracken at Covehithe Broad on the Suffolk coast on 12th Sept., 1910, and noticed two eggs, brilliant black and more attenuate at the base which was fixed extremely lightly to the skin, one on dorsal line at incisure of third and fourth segments, and one disco-laterally at the incisure of fourth and fifth. First egg hatched on 16th and larva began sucking diligently, causing a black wound in host below insertion of egg; on 17th it had doubled its size by 10 a.m. Second egg was exactly 24 hours later in emerging. On 18th at 10 a.m. the *Paniscus* larva was white and treble size of its egg-shell, in which its anus is still hidden; later one was as first 24 hours ago; host showed strong signs of pupating. On 19th at 10 a.m. the first larva had doubled its size since 18th and was now green; it had changed position of mouth to exact incisure, but anus still in shell; the second was as first 24 hours ago; the host now rolling helpless (probably for lack of earth in which to pupate). On 20th at 10 a.m., both again much grown; the first with head again moved to fresh spot, nearer host's head. On 21st host, failing to pupate, turned black except area where first parasite is feeding; second parasite appears to have died through feeding in black body; unaltered on 22nd. On 24th and 25th the only remaining parasite attained size of 3 mm., very pale green with white granular markings, wanting along dorsal line, segmentation very distinct, sides rounded but with no deplanate lateral margin, and anus still retained in egg-shell; the host is becoming much depleted, out of all proportion to size of parasite, and is black everywhere but in latter's immediate vicinity. On 26th very little green area left; parasite 5 mm. in length. On 28th latter cast its skin and dorsal prolegs were apparent; mouth-hold of host lost. On 29th parasite not recovered its suction and seems somewhat shrivelled; died 30th.

Table of Species.

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| (10). | 1. | Basal nervure continuous; occipital costa wanting [PARABATUS, Thoms.]. | |
| (5). | 2. | Head small; thoracic spiracles circular; terebra exerted. | |
| (4). | 3. | Areolet entire; stigma rufescent; length, 8 mm. | 1. TARSATUS, <i>Brisch.</i> |
| (3). | 4. | Areolet incomplete; stigma nigrescent; length, 6 mm. | 2. NIGRICARPUS, <i>Thoms.</i> |
| (2). | 5. | Head as broad as thorax; spiracles oval; terebra not exerted. | |
| (7). | 6. | Thorax broadly black-marked; petiole elongate | 3. VIRGATUS, <i>Fourc.</i> |
| (6). | 7. | Thorax not black-marked; petiole shorter and stout. | |
| (9). | 8. | Metanotal carinae wanting; scutellum not apically carinate | 4. LATUNGULA, <i>Thoms.</i> |
| (8). | 9. | Metanotal carinae distinct; scutellum strongly carinate | 5. CRISTATUS, <i>Thoms.</i> |
| (1). | 10. | Lower basal nervure postfurcal; occipital costa distinct [PANISCUS, Thoms.]. | |
| (16). | 11. | Head posteriorly distinctly narrower than eyes; vertex narrow. | |
| (15). | 12. | Front tarsi basally straight; stigma testaceous. | |
| (14). | 13. | Anus determinately deep black; vertex narrower | 6. MELANURUS, <i>Thoms.</i> |
| (13). | 14. | Anus not determinately black; vertex broader | 7. TESTACEUS, <i>Grav.</i> |
| (12). | 15. | Front tarsi basally strongly curved; stigma stramineous | 8. GRACILIPES, <i>Thoms.</i> |
| (11). | 16. | Head posteriorly as broad as eyes; vertex broad. | |
| (20). | 17. | Ocelli remote from eyes; thoracic transcarina obsolete. | |
| (19). | 18. | Head broader than eyes; antennae as long as body | 9. FUSCICORNIS, <i>Holmgr.</i> |
| (18). | 19. | Head not broader than eyes; antennae shorter than body | 10. BRACHYCERUS, <i>Thoms.</i> |
| (17). | 20. | Ocelli contiguous with eyes; thoracic carina strong | 11. CEPHALOTES, <i>Holmgr.</i> |

There appears small reason for regarding the species here grouped as constituting two genera, though *Parabatus* possesses just those distinctions so useful as main divisions of a single one. Thus the basal nervure is rarely directly continuous through the median: in *P. nigricarpus* it is always subpostfurcal and in *P. Franki* it is strongly antefurcal; isolated examples of *P. cristatus* have it subpostfurcal, and these are extremely closely allied to small *P. opaculus*, in which it varies from only subpostfurcal to very far beyond the junction of the upper basal nervure with the median; nor is the occipital costa a constant character. Care must also be exercised to avoid confusion with the very similar Tryphonids, *Perilisus pallidus*, *Prionopoda stictica* and *Mesoleptus testaceus*, all of which are known by their basally straight external radius, two by their simple tarsi and the third by its curved upper basal nervure.

1. *tarsatus*, *Brisch.*

Paniscus tarsatus, Brisch. Schr. Nat. Ges. Danz. 1880, p. 138; Bridg.-Fitch, Entom. 1885, p. 13, ♂ ♀. *P. (Parabatus) tarsatus*, Kok. Horae Soc. Ent. Ross. 1899, pp. 130, 137.

A very slender, testaceous species. Head small, posteriorly constricted and slightly narrower than eyes; palpi, mandibles except their black apices, clypeus, face and external orbits flavous. Antennae slender, as long as body, with the third and fourth joints of equal length. Thorax with a subradical mark, and usually the lateral sutures, flavous; mesonotum with one or three vittae often infusate and the notauli so strong as to render the surface trilobed; ♂ with mesopleurae usually flavous and mesosternum sometimes infusate; metathorax with circular spiracles and no carinae. Basal segment sublinear, hardly explanate apically; terebra piceous and exerted, as long as basal segment. Legs slender; hind tarsi whitish, with base of metatarsi testaceous; ♂ with anterior coxae and trochanters pale. Tegulae flavous; stigma flavous or piceous-red; areolet sessile or petiolate, sometimes subobsolete. Length, 8-9 (or -11, Brisch.) mm.

Known by its flavous-marked thorax and head, very slender form, exerted terebra and usually pale stigma, in the colour of which last almost solely it differs from the next species.

Taken singly in northern Europe; and apparently common in Prussia, where its author bred it from *Drepana fulcula* and *unguicula*, *Eupithecia absynthiata*, *exiguata*, *lariciata*, *succentauriata* and *castigata*; he describes the cocoon (well figured at Entom. 1884, pl. ii, fig. 7) as elongate, elliptic, black or brown with a narrow central pale girdle. It was introduced as British by Bridgman (1881, Trans. Ent. Soc. p. 157 *et* Entom. p. 139) on the strength of both sexes bred at Plymouth from *Eupithecia abbreviata* in 1880 by Bignell, who subsequently (Entom. 1883, p. 65) raised it in Devon during May from *E. castigata*, *absynthiata*—also bred thence by Atmore in Norfolk—and *virgaureata*, as well as (Devon List) *E. lariciata* on 1st July; W. Fletcher added (Entom. 1884, p. 70) *E. vulgata* to its hosts, Warren (*loc. cit.* 1885, p. 15) confirmed *E. exigua*, and Bridgman tells us (Norf. Trans.) that Atmore produced it from *E. extensaria* at Kings Lynn.

Bridgman, who took it at Norwich, thought it not uncommon with us; but I have captured only a single example, on oak in a wood near Brandon during the evening of 5th June, 1903; though I have material from Shere (Capron), Felden (Piffard), a pale female which Slater took at light at Withycombe near Taunton on 29th September, 1908, and a male bred by Mrs. Holmes at Torcross in 1907, from a larva—probably *Eupithecia absynthiata*—feeding on *Artemisia Absinthium*; Col. Nurse bred a female from larvae of *E. consignata* on 5th August, 1912, in west Suffolk and Atmore has sent me a female bred from *Collix sparsata* on 2nd May, 1905.

2. *nigricarpus*, *Thoms.*

Parabatus nigricarpus, Thoms. O.E. xii. 1196, ♀; Brauns, Arch. Nat. Meckl. 1889, p. 80; Kok. Horae Soc. Ent. Ross. 1899, p. 135; Schm. Opusc. Ichn. p. 1849, ♂ ♀.

A small and delicate pale testaceous species, with head, thorax and abdomen more or less broadly infusate. Vertex narrow and pale citrinous, or in ♂ infusate; ocellar region often nigrescent. Mesonotum with

three more or less broad vittae, and often disc of metathorax, infusate; metanotal transcarina wanting, its spiracles circular. Abdomen discally more or less infusate, of ♂ often except the incisures and of ♀ usually towards its base; anus of ♀ strongly compressed, with terebra nearly as long as basal segment. Stigma nigrescent; areolet externally obsolete; lower basal nerve slightly postfural; parallel nerve emitted far above centre of brachial cell. Length, 5-6 mm.

Distinct in the nigrescent stigma, incomplete areolet and small size; though the small head and slender form ally it closely to *P. tarsolus*.

A local species, found in Sweden and sometimes common in damp and shady places in grass among alders in Thuringia. Certainly rare with us; Bridgman records (Trans. Ent. Soc. 1889, p. 419) a single female, with the abdomen neither basally dark nor apically very compressed, which was captured by Atmore at Kings Lynn in Norfolk; and I have one male in Capron's Surrey collection.

3. *virgatus*, Fourc.

Ichneumon virgatus, Fourc. E.P. ii. 401; Vill. Linn. Ent. iii. 204. *Ophion virgatus*, Gr. Nov. Act. Curios. 1818, p. 295. *Paniscus virgatus*, Gr. I.E. iii. 625; Newport, Trans. Linn. Soc. 1852, xxi, p. 61, pl. viii, figg. 13-19; Holmgr. Sv. Ak. Handl. 1858, p. 32, ♂ ♀. *Parabatus virgatus*, Thoms. O.E. xii. 1197; Brauns, Arch. Nat. Meckl. 1889, p. 80; Schm. Opusc. Ich. p. 1853, ♂ ♀.

Rufescent-testaceous with three mesonotal vittae, and a sternal mark, conspicuously black. Length, 7-12 mm.

Instantly known by the black thoracic markings, rotund-oval meta-thoracic spiracles, obsolete or wanting transcarina, subelongate basal segment, hardly exerted terebra, and by the white or stramineous hind tarsi.

One of the commonest European species, extending to Algeria; but distinctly uncommon with us. Hope sent a couple of males to Gravenhorst from Netley, and Bridgman says Thouless took it in Foxley Wood in Norfolk; I possess but a single female and three males, taken by Elliott at Banchory in Kincardine during August, 1909, (E.M.M. 1910, p. 37), bred at Rannoch on 7th July, 1905, by Cockayne from *Oporabia dilulata*, and at Ipswich by myself. Lyle has twice bred it from larvae of the same geometer in the New Forest on 26th June, 1910, and 28th June, 1911, and especially noted it to be a solitary parasite in both; a huge female of 15 mm., beaten from hawthorn on 25th May, contained between fifty and sixty black ova.

Bridg-fitch summarise (Entom. 1884, p. 124) Newport's excellent account of this species' life-history—which I consider to refer more properly to *P. cristatus*—in the Linnean Transactions. "The parent *Ichneumon* deposits her black, shining, pedunculate eggs on the caterpillar of *Hadena pisi*, when this is nearly full-grown and ready to pupate. The fated larva, exhausted by the parasites, has but sufficient strength to complete and tapestry its cocoon or earthen chamber, as the case may be, before it dies, leaving its newly-formed abode to the occupation of its enemies, which grow rapidly, casting their skins three times: but as the body of the larva is still connected with the egg-shell they are not entirely got rid of until the larva is mature and becomes detached, before forming its own black, cylindrical, leather-like cocoon. The larva is mature on the fifteenth day: it is more than half-an-inch

(13 mm.) long, of a curved form, being smallest at each extremity, and with lateral fleshy tubercles." Stenton supplements our former knowledge of the habits of this species (Entom. 1910, pp. 210-212) by some very close and intimate observations.

It is recorded from a good many hosts, a large proportion of which are probably assignable to *P. cristatus*. Gravenhorst raised it from *Bombyx bifida* in October, Bignell on 2nd May in Devon from *Odonotopora bidentata*, Brischke from *Eupithecia absynthiata* and other Geometres in Prussia with *Drepana unguicula* and *Halias prasinana*, from which last it was also bred by Giraud, and in Devon on 26th April by Bignell; Bridg.-Fitch. mention (Entom. 1885, p. 14) *Eupithecia succentauriata*; Stenton induced it (*i.e.*) to oviposit in *Cheimatobia boreata*, *brumata*, *Hybernia defoliaria* and *Oporabia dilutata*; Bignell raised it from *Cosmia trapezina* in Devon on 19th July, Bridgman tells us (Norf. Trans.) that W. Fletcher bred it from *Cabera pusaria* and Giraud adds (Ann. Soc. Fr. 1877, p. 406) the large *Catocala promissa* to the victims.

4. *latungula*, Thoms.

Parabatus latungula, Thoms. O.E. xii. 1196; Brauns, Arch. Nat. Meckl. 1889, p. 81; Schm. Opusc. Ichn. p. 1853, ♂ ♀. *Paniscus latungula*, Kok. Horae Soc. Ent. Ross. 1899, p. 136.

A not very slender species, clear testaceous, with the abdomen usually slightly darker. Head not constricted posteriorly, as broad as eyes, with ocelli large and face flavidous. Antennae subfiliform and distinctly nigrescent from near their base. Thorax not flavous-marked, rarely with somewhat pale mesonotal vittae; metathoracic transcarina always entirely wanting, its spiracles subcircular. Scutellum indistinctly carinate at most to its centre. Terebra subreflexed and very slightly longer than the truncate anus is high. Hind tarsi whitish. Stigma deep red or clear luteus; basal nervure continuous. Length, $6\frac{3}{4}$ -9 mm.

The dark antennae, total lack of metanotal carinae and its subcircular spiracles will render this species distinct, though it is very like *P. cristatus*; this distinction is confirmed by the absence of the latter among the numerous examples of the former from Bentley.

A social insect in the perfect state, or locally common; it is the most frequent *Parabatus* in Sweden, Germany, and is said by Schm. to fly round young growth of beech and sycamore in May and June, though nothing is known of its hosts; France (Gaulle), Holland in August (Burgst), and Belgium commonly from August to October (Tosquinet). I can now find no British record of this species, though it was included by me as indigenous in 1901; it is not by any means generally distributed in my experience, and I only possess single specimens from Oxshott in May (Beaumont), Felden (Piffard), Lyndhurst at the end of May (Adams), Devon (Stanley Edwards), Greenings in June, 1871 (W. Saunders), Shere (Capron), Guestling in 1889 (Bloomfield) and Ampton in west Suffolk (Nurse). In the Bentley Woods near Ipswich it is one of the most abundant of all spring Ichneumonidae, constantly seen flying among young birch and hazel trees and settling upon their leaves in the sun, in company with *Prionopoda slictica* which is so similar, from 16th May to 16th June, 1896-1904, though certainly exactly restricted to that one month at this locality; I took a male at Assington Thicks, Suffolk, on 17th May, 1901, on young birch; but elsewhere I only know it from

Brockenhurst where Cross also found it, Perry Wood and Matley Bog in the New Forest still between the same dates, which render one chary of accepting van Burgst's and Tosquinet's records.

5. *cristatus*, Thoms.

Parabatus cristatus, Thoms. O.E. xii. 1197; Brauns, Arch. Nat. Meckl. 1889, p. 81; Schm. Opusc. Ichn. p. 1854, ♂ ♀. *Paniscus cristatus*, Kok. Horae Soc. Ent. Ross. 1899, p. 136.

A somewhat stout, rufescent-testaceous species, with the abdomen not infrequently a little infusate; the largest species of *Parabatus*. Head not constricted posteriorly, nearly as broad as eyes, ocelli large and orbits subflavoids. Antennae subattenuate and entirely testaceous. Thorax not flavous-marked; metathoracic transcarina always very distinct on either side, its spiracles oval. Scutellum very strongly carinate laterally to apex. Terebra reflexed and not longer than the truncate anus is high. Hind tarsi stramineous or whitish. Stigma clear, sometimes pale, testaceous; basal nervure continuous. Length, 9-14½ mm.

Distinct from *P. virgatus* in colour and the oval spiracles; and from *P. latungula* in larger size, distinct metanotal cristae, longer basal segment and its basal foveae, third segment margined to spiracles and more strongly carinate scutellum. Doubtless all three were included under the first name by Gravenhorst and the older authors, including Newport, whose notes under that species probably relate to the present.

First recorded as British by Bridgman (Trans. Ent. Soc. 1889, p. 420) on a solitary bred female from Stornoway. It is noted from Sweden by Thomson, as often common in Germany by Schm., bred in France from *Sarothrips revayana* by Gaulle, and Belgium in May and August by Tosq. With us it is frequently bred but uncommon on the wing: Freshford near Bath (Charbonnier), Felden (Piffard), Guestling in 1887 (Bloomfield; [omit *P. virgatus* from Sussex Vict. Hist.]), and the New Forest (Miss Chawner); I took one at Ipswich in 1893 and another female among alders at Reydon near Southwold on 2nd July, 1906. On 8th May, 1901, Montgomery sent me a male, just emerged from its own cocoon within that of *Halias prasinana*, from Chalfont Road, Bucks; on 4th May 1910, W. B. Davis sent a male, three of which had just emerged from their own cocoons ex the same host at Stroud, Glos.; on 13th May, 1909, Parkinson Curtis sent a female from a "pupa" of the same host from Cranborne, Dorset. Cross also bred a couple of females at Brockenhurst in May, 1902, from *Eupithecia*; Adams raised it from *Dicranura furcula* in the New Forest in 1901; and W. E. Wattam has given me another raised by him at Huddersfield from *Tryphaena pronuba*. Two females were bred by Eric Shaw from Manchester *Hadena pisi* on 10th June, 1903; and Clutton sent me twelve cocoons of this parasite from the same host, found at Burnley, on 30th December, 1901. The first male emerged on 4th April following and I was attracted to it by the noise its mandibles were making upon the cardboard of its box; the second was out on 12th morning; third on 13th, between 1 and 10 p.m.; fourth and fifth on 14th by 11 a.m.; sixth (first ♀) on 18th by 10 a.m.; seventh (♂) by 4 p.m. the same day; eighth (♀) on 20th by 10 a.m.; ninth (♀) I opened and preserved in spirits; the tenth and last (♀) emerged on 21st between 11 a.m. and 10 p.m.; eleventh died of mould as a larva; and the twelfth cocoon produced the *Exetastes nigripes* referred to at Ichn. Brit. iii. 298.

All the above appear instances of solitary parasitism; but I have seen in Lyle's collection a male together with a bundle of five cocoons from each of which a male emerged, not all upon the same day, about 12th July, 1911, from a single caterpillar of *Agriopsis aprilina* at Brockenhurst; Mr. Lyle adds that he raised a brood of three during the preceding May from a single cocoon of *Haliastur prasinum* and subsequently found two cocoons in one of the host's cocoons; it only emerged singly to him on 25th August from a larva of *Anarta myrtilis*, all in the same locality.

6. *melanurus*, Thoms.

Paniscus testaceus, Holmgr. Sv. Ak. Handl. 1858, p. 32; Brauns, Arch. Nat. Meckl. 1889, p. 84; Schm. Opusc. Ich. p. 1874, ♂ ♀ (*nec* Grav.). *P. melanurus*, Thoms. O.E. xii. 1199, ♂ ♀.

A clear rufescent-testaceous species, large and strongly elongate, with the anus always deep black. Head strongly constricted posteriorly, with vertex very narrow and ocelli touching eyes; ocellar region always deep black. Antennae with at most their apical third nigrescent. Mesonotum not strongly nitidulous, very rarely subinfusate, with elongate notauli; apical transcarina of metathorax laterally strong. Scutellum laterally carinate to apex. Anus entirely deep black from base of fifth segment; basal segment very rarely subinfusate, as also are the hind femora; hind tarsi usually substramineous; stigma clear testaceous. Length, 15-20 mm.

The only species with decidedly black anus.

I cannot follow recent Continental authors in terming this species *P. testaceus*; Thomson would hardly have suggested a new name if he had thought Holmgren's species synonymous with Gravenhorst's, which was fulvous with "abdomen rarissime segmentis 6 et 7 totis et segmenti 5 apice nigrofusis," while the former says "abdomine apice ut plurimum toto nigro"; thus *P. opacus* = *testaceus*, Gr. and *P. melanurus* = *testaceus*, Holmgr.

I possess examples with entirely black anus from Guestling in 1888 (Bloomfield), Shere (Capron), Felden (Piffard), Tostock in Sept. (Tuck); West Runton in August (Wainwright), and Stalham in Sept. (Bird) in Norfolk; S. Leverton in Notts during June (Thornley); Cambuslang at end of June (Dalglish), and Strathblane in July (G. W. Ord). It is by no means a common species and I have only taken some half dozen examples, mostly at light at Monks Soham House in August and September, where it once occurred on sugar in the garden; a male turned up by the River Gipping at Ipswich in August, 1894, and another was flying swiftly and settling on a hedge during a rain shower early in August, 1900, at Leiston in Suffolk.

7. *testaceus*, Grav.

Paniscus testaceus, Gr. I.E. iii. 626; Ratz. Ich. d. Forst. i. 100; ii. 80; iii. 81; Brisch. Schr. Nat. Ges. Danz. 1880, p. 138; Bridg.-Fitch, Entom. 1885, p. 13. *Paniscus opaculus*, Thoms. O.E. xii. 1199, ♀; Brauns, Arch. Nat. Meckl. 1889, p. 84; Schm. Opusc. Ich. p. 1870, ♂ ♀. Var. *P. ocellaris*, Thoms. O.E. xii. 1199, ♀; *P. testaceus*, var. *ocellaris*, Kokojew, 1899.

A testaceous-red species with the head somewhat narrow posteriorly, the ocelli not or hardly touching eyes, and the hind tarsi testaceous. Length, 13-17 mm.

Extremely like the last species in clypeal structure, metathoracic transcarina, somewhat dull mesonotum and apically infusate antennae; but a little smaller, the anus and usually ocellar region not black or at

most indefinitely infusate, the vertex posteriorly less narrow and the large ocelli not contiguous with the eyes.

P. ocellaris, which seems at most but a form of this species, with the ocellar region black, etc., is recorded by Bridgman from Norfolk, and is no rarer with us than the type.

I consider this species to be certainly Gravenhorst's *P. testaceus* and consequently I have added here the hosts ascribed to the Gravenhorstian species. Not a very common insect with us; I have it from Hastings (Esam), Guestling (Bloomfield), Shere (Capron); bred at Weymouth on 30th May, 1900, from *Acronycta psi* (Peachell); the New Forest (Miss Chawner), Lyndhurst in August (Adams), and in September at Brockenhurst (Cross), where I took it at light in May, 1895; West Somerset bred on 24th April, and in May (Slater), Ipswich at light on 30th Sept. (Platten), Brockenhurst at light (Lyle), Doncaster 9th May (Cassal), Macclesfield in 1895 (South) and at Burnley (Clutton). It has occurred to me only singly and usually at light, to which it flew at Southwold on 18th Sept., 1900, and at 9.30 p.m. on 22nd; but at Monks Soham it has flown in as late as 11 p.m. on 24th July; my single exception was on 5th Sept. when I found a female sucking the stylopods of *Angelica sylvestris* at Foxhall. Peachell has kindly given me a male, bred in September, 1901, from *Cucullia verbasci*, at Princes Risborough in Bucks. Bankes has sent me a female "bred June 20th, 1905, from larva of *Cucullia gnaphalii*, Hb., found in Tilgate Forest, Sussex, during 1904"; and another from Mrs. Holmes at Sevenoaks is "ex pupa of *C. gnaphalii* on 1st July, 1906"; of thirty-one pupae, only six did not produce this parasite; the larva spins and pupates in the normal manner. The cocoon is smooth and exactly like that of *Exetastes cinctipes* (Ichn. Brit. iii. 293), excepting a slight central dilation.

A note in my MS. diary is thus:—"Dec. 2nd, 1903. Mr. Edward Goodwin sent from Maidstone a dry larva of *Cucullia gnaphalii*, Hb., broken in halves centrally, which was quite empty and contained no strands; nothing at all, but a single full-fed Ichneumonid larva, occupying about three-quarters of the interior of its dry host when extended; in the box were two other full-fed and similar parasitic larvae, which Goodwin says all fed upon the single host-larva. They are of the usual Ichneumonid primrose colour, with only the mandibles (?) and two spots upon the extreme anus black, the apices of the eyes and mouth parts infusate, the spiracles are not dark and the explanate lateral lobe is less conspicuous than that of any Ichneumonid I have examined, besides being curiously three-fold longitudinally. They differ in two ways from any allied larvae I have seen; 1st, the mandibles are not transverse, but vertical like walrus' tusks (quite black and very long, strongly acuminate and most effectively used to grip a fulcrum and draw up the body in progression); the head [see fig.], which is very small, appears from in front



subquadrate, with an oblique line extending quite across it on either side, and eyes at its upper lateral angles; the body is transversely convex, a little deplanate ventrally, primrose with sometimes an orange longitudinal dorsal stripe near the anus. 2nd, the anus is retracted and, even when the larva is stretched to its fullest extent, is far within the subapical segment; in its centre are two lateral black and not

quite circular dots, horseshoe-shaped and very conspicuous. Length fully extended, 10 mm.—In the precephalic segment of the dead host are

embedded the bases of three pure white but not shining, elongate-ovate and subreniform eggs, from which the above three larvae doubtless emerged; they are in no way eaten.—Goodwin adds “The species appears to lay its eggs generally near the head of the host-larva and in numbers varying from one to fifteen or sixteen, but as a rule only three to five; I never find the eggs on larvae less than about three-quarters grown” (? do they not attack the host till its last skin be cast).—One of these three larvae seemed to be dead by March 7th, 1904; another had become strongly convex, the lateral lobes being then practically continuous with the rotundity of the body, which is become distinctly fatter towards the head and slightly attenuate anally, as though preparatory to pupation; the third is still in the host-larva.—All three unfortunately died, though little doubt can, I think, be entertained that they appertained to the present species; but it is remarkable that none of the three observers note ectoparasitism.

The following recorded hosts were, perhaps, better given generically, since to the old authors the present species was most vaguely circumscribed; I omit the smaller Geometers, which are placed under *P. gracilipes*, and *Dicranura vinula* since the species bred from the latter is almost certainly *P. cephalotes*, though attested by Fitch (Entom. 1880, p. 68) and Bridgman (l.c. 1884, p. 70). Recorded hosts of *P. testaceus* are:—*Dicranura bifida*, *Clostera anachoreta*, *Acronycta psi* (teste Bridg.-Fitch, Entom. 1885, p. 14), *Nonagria geminipuncta* (Fletcher, l.c. 1884, p. 70), *Hadena pisi* (Marsh, l.c. 1881, p. 130), *Smerinthus populi* (Marshall, Ent. Ann. 1874, p. 124), *Bombyx pini*, *Cucullia asteris* (Ratz. ii. p. 80), *Dicranura furcula*, *Cucullia scrophulariae* (Ratz. iii. p. 81), *Phigalia pilosaria*, *Nyssia pomonaria* and other Vienna host by Scharfenberg; *Cucullia artemisiac* and other Noctuae (Grav. l.c.), *Hybocampa Milhauseri* (Tasch.), *Acronycta leporina*, *Cucullia argentea* larvae (Brischke), *Toxocampa craccae* (Kriechb.), *Clostera curtula*, *Polia polymita*, L., *Perigrapha cincta*, Fab., *Cloanthia radiosa*, Esp. (Mocsáry), *Acronycta megacephala*, *Mesogona ovalina*, *Cucullia lychnitis*, (Giraud, Ann. Soc. Fr. 1877, p. 406), and in Devon *Hadena dentina* on 24th Nov. and *Xylina rhizoditha* on 22nd May (Bignell). As regards Bouché's records from *Cimbex femorata* and *Clavellaria amerinae*, I believe in them no more than in Rondani's from *Lophyrus abietis*, L., and *Lyda erythrocephala*, L.; some Tryphonid was in both cases doubtless mistaken for the present species. Netley, Yorks, Norfolk, etc.; I possess examples of both sexes with infusate thorax and ferrugineous abdomen from Ashby near Doncaster in May (Cassal), Felden (Piffard), Retford (Pegler) and Tooting on ivy-blossom, in autumn (Sparke).

8. *gracilipes*, Thoms.

Paniscus gracilipes, Thoms. O.E. xii. 1201; Brauns, Arch. Nat. Meckl. 1889, p. 84; Kokujew, Horae Soc. Ent. Ross. 1899, p. 131; Schm. Opusc. Ichn. p. 1869, ♂ ♀.

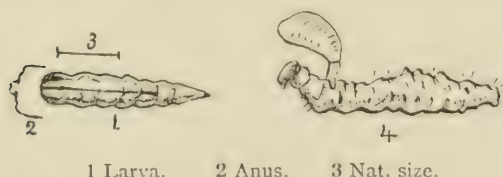
Entirely clear testaceous, small and fragile, with front tarsi curved. Head not posteriorly broad; vertex not black between ocelli, which are contiguous or subcontiguous with the eyes; clypeus deeply discreted. Antennae infusate only at their apices; second flagellar joint half as long again as scape. Mesonotum nitidulous, with notauli extending only to its centre and rarely two indefinite flavous dorsal vittae; metathoracic apical

transcarina wanting or at most distinct laterally. Scutellum laterally carinate to apex. Petiole elongate, with its lateral foveae not black. Legs distinctly slender, with front tarsi basally strongly arcuate. Stigma very pale testaceous; lower basal nervure oblique, strongly postfurcal. Length (British), 9-12 mm.

I possess numerous examples of a species, agreeing exactly with *P. opaculus* except in their smaller and more fragile body, paler colour, almost entirely pale antennae, slightly narrower vertex, almost transparent stigma, and especially in the curved front tarsi. This I believe to be *P. gracilipes*, not hitherto noticed in Britain, though the lower basal nervure is not unusually oblique and the metanotal carina varies from laterally strong to altogether wanting. To it I assign the smaller hosts of *P. testaceus*, given by the older authors. My examples are at once known by the basal joint of the front tarsi in ♂ being strongly curved throughout, and of ♀ basally inflexed.*

Abundant in Sweden and Germany; France and in July in Belgium. It is abundant with us though hitherto regarded as a small race of *P. testaceus*; I have it from South Leverton (Thornley), Colwyn, Lewisham and Church Stretton, all in Aug. (Beaumont), Ipswich at light in Sept. and Oct. (Platten), Stalham in Norfolk during Sept. (Bird), captured at large on 17th March, 1902, at Lincoln (Musham), bred from *Epunda viminalis* at Doncaster on 23rd August, 1899, and from unknown host at Burnley (Clutten), Leeds in Aug. 1868 (Roebuck) and York (Porritt). It has usually occurred to me at light, frequently at electric light in the middle of Ipswich, especially in 1895, during July, August and October; and males have come in to my study light there in May and June, as well as at Stoke Newington, London. Elsewhere it has been swept once from reeds in Covehithe Broad and taken in the adjacent town of Southwold; it would appear to be a garden insect, since I have netted it flying in Ipswich at dusk and about a box-bush here at Monks Soham in June.

Early in 1900 Ransom sent me males, bred by him at Sudbury in Suffolk from larvae of *Melanippe fluctuata*, with the note, "They do not emerge from the pupae, for I find them as distinct pupae in my breeding box; when the larvae of *fluctuata* are full-fed they burrow in the usual way and it appears that the parasite in changing to a pupa also casts off the skin of its host." On 9th October, 1899, Mr. Clutten sent four external larvae, each attached by its mouth to a caterpillar of Burnley *Melanippe fluctuata*; these larvae (see fig.) were



1 Larva. 2 Anus. 3 Nat. size.

pale brown or greenish, with the central dorsal line darker and pale margined; the mouth, which alone I saw used in progression, is on the lower surface and appears longitudinally black when viewed from above through the inter-

vening tissue; a median ventral band is rufescent; there are no legs; the spiracular line is discreted, fleshy and whitish; each spiracle bears a short and stout bristle, doubtless as a means of propulsion; the vent is upon the upper surface of the apical segment and is elevated, red, corneous, smooth, truncate with a longitudinal carina in the centre, reminding one forcibly of a short and blunt Spthingid larva horn; the mature larva (see fig.) was

but $8\frac{1}{2}$ mm. in length. With these larvae, Clutton also sent twenty-six cocoons of the same parasite, raised from *M. fluctuata* at the same locality (probably no more than earlier examples of the same brood); these were very smooth and nigrescent with a slightly paler central girdle, 11 mm. in length and 4 mm. in breadth at their hardly explanate centre. From these there emerged between the 20th May and 26th June following eighteen examples of the present species and, from three of the cocoons, nearly thirty hyperparasitic *Chalcids*, some unnameable *Phromalus*; the first (σ) was emerged by 10 a.m. and the whole of the *Chalcids* immediately following by the same hour on 20th-25th; then came six males from the 22nd May to 3rd June, mainly out in the morning by 10 a.m. though one certainly emerged between 2 and 9 p.m. on 25th, and a second equally certainly between 10 a.m. and 9 p.m. on 22nd; the last was extremely active, with perfected wings and, when the box was opened the following morning, at first attempted to conceal itself (which may account for the rarity of *Panisci* during daytime), but after a short time it flew to the window curtains and there buzzed with great agility. Subsequently three males and five females emerged thence to the 18th June; and the last (φ) was out by 10 a.m. on 26th; one or more died as nymphs, doubtless through artificial temperature. This is probably the species bred from *Eupithecia castigata* (Entom. 1883, p. 65) by Bignell in Devonshire.

9. *fuscicornis*, Holmgr.

Paniscus fuscicornis, Holmgr. Sv. Ak. Handl. 1858, p. 32; Bridg.-Fitch, Entom. 1885, p. 13, σ φ ; cf. Brisch. Schr. Nat. Ges. Danz. 1880, p. 138. *P. dilatatus*, Thoms. O.E. xii. 1200; Brauns, Arch. Nat. Meckl. 1889, p. 83; Schm. Opusc. Ichn. p. 1861, φ ; cf. Kok. Horae Soc. Ent. Ross. 1899, p. 128, nota.

Rufescent-testaceous. Head posteriorly explanate and distinctly a little broader than eyes; clypeus somewhat deeply discreted; ocelli not large, remote from the eyes which do not reach mandibular base; cheeks subuccate and short, but distinct. Antennae quite or nearly as long as body, black and basally pale with the second flagellar joint not or hardly longer than scape. Mesonotum nitidulous and not very closely punctate, with notauli not extending beyond centre; metathorax short and transaciculate with the transcarina not strong, though always laterally distinct. Scutellum strongly carinate laterally to apex. Basal segment not elongate, a little curved, apically subdilated, dorsally transconvex and centrally sulcate; petiole with basal lateral foveae black; second segment a little longer than apically broad, with epipleurae nigrescent. Femora somewhat stout; hind tarsi not stramineous, rarely infusate. Wings hyaline with stigma stramineous or pale testaceous, emitting radius from its centre; lower basal nervure oblique and strongly postfurcal. Length, 8-13 mm.

There can be no doubt that *P. dilatatus* is the species described by Holmgren, for it is the only one of this group to which his "capite subbuccato pone oculos" will apply; and in this respect differs from all its allies, except *P. cephalotes* which has stout metanotal transcarina and larger head.

Sweden in July (Holmgr. and Thoms.); almost unknown elsewhere—though Brischke claims to have bred it in Prussia from PUPAE of *Leucania obsoleta* and *Anarta myrtilli*—but not rare with us. I have it from the

New Forest, several (Miss Chawner), Lyndhurst in June (Adams), Deal in May, 1872 (Edward Saunders), several at Felden in Herts (Piffard), Ipswich at light in November (Platten), Monks Soham at light at 8.30 p.m. at the end of August and in the Southwold salt-marshes on reeds about the same time (Morley), Barmouth towards the end of June (Yerbury); and a ♂ bred by Waterston, who noticed that its larva had been externally parasitic upon one of *Acronycta psi*, from its own cocoon which exactly resembles that of *P. gracilipes* but with no paler girdle, on 28th June, 1899, at Edinburgh. A round dozen of the present species flew into light at Brockenhurst between 8 and 10.30 p.m. on the 26th May, 1911; they were all females, says Lyle.

10. *brachycerus*, Thoms.

Paniscus brachycerus, Thoms. O.E. xii. 1201; Brauns, Arch. Nat. Meckl. 1889, p. 83; Schm. Opusc. Ichn. p. 1861, ♂ ♀; cf. Kok. Horae Soc. Ent. Ross. 1899, p. 128, nota.

Extremely like the last species but very distinct in: A deep red species; head posteriorly subparallel-sided but neither buccate nor at all narrower than eyes; vertex slightly broader, with ocelli smaller and strongly remote from eyes. Antennae slightly shorter than body in ♂, and but three-quarters its length in ♀; deep black with scape, and in ♀ the five or six basal flagellar joints, alone rufescent; subfiliform, with apices of basal flagellar joints distinctly nodulose. Metathoracic transcarina obsolete or at most tuberculiform. Petiole stouter and not sulcate with its lateral foveae, and in ♂ its disc at the base, distinctly black. Legs a little stouter. Stigma very conspicuous, of ♂ nigrescent or deep piceous, of ♀ red and not testaceous. Length, $8\frac{1}{2}$ –13 mm.

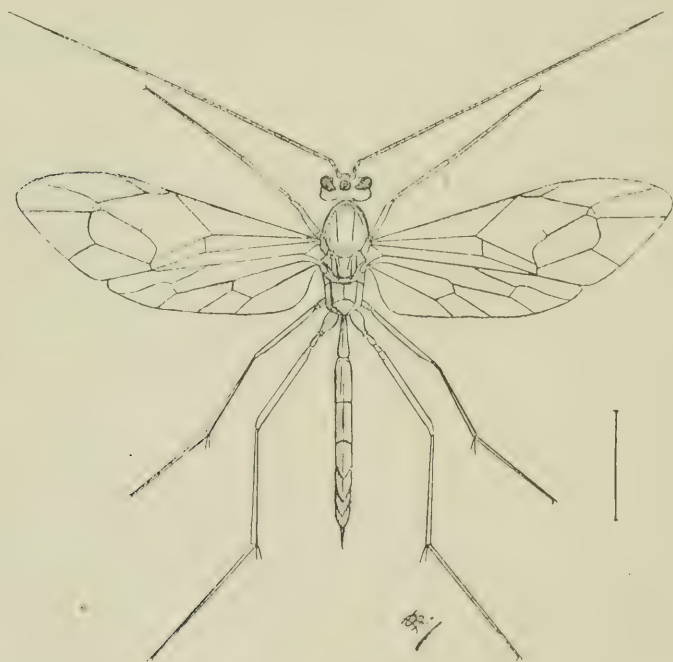
I had drawn up the above distinctions from *P. dilatatus* before noting that they exactly agree with those set forth by Thomson for his *P. brachycerus*; he also adds that the thorax is longer and the first segment longer than the second, which is nearly twice longer than broad; from *P. gracilipes* he distinguishes it by the black petiolar foveae; shorter second flagellar joint and stouter legs, to which the darker red of the body and much broader black of the flagellum may be added.

"Funnen pa sandfalten i Skane och pa Oland" (Thoms.); France (Gaulle). Unknown elsewhere and extremely local with us. On 10th June, 1900, three males occurred to me on the flower-heads of *Chaerophyllum temulum* at Town Street near Brandon; on 9th June, 1903, I discovered a female at the roots of *Reseda lutea*, growing in sand, at the same spot; on 7th June, 1910, I swept a second female at the Brandon staunch, half-a-mile away; and on 28th May, 1901, a small female was netted, flying in the sunshine upon the high sandy plateau, at Foxhall. This is doubtless the species recorded, with a query, as *P. fusicornis*, Hgr. (Entom. 1884, p. 67), found by Raynor "piercing a larva of *Lithostegia nivearia*," DL. = *griseata*, Schiff., which is extremely local in Britain and one of the especial rarities of the breck sands of the Brandon district. There is a "British" female in the National collection; and on 19th May, 1909, Col. Nurse took three males at West Stow in Suffolk, to which county it is at present confined with us.

11. *cephalotes*, *Holmgr.*

Paniscus inquinatus, Gr. I.E. iii. 631, ♀ (?), (*nec* Gray, Ann. Nat. Hist. v, 1860, p. 339). *P. cephalotes*, Holmgr. Sv. Ak. Handl. 1858, p. 31; Brisch. Schr. Nat. Ges. Danz. 1880, p. 138; Brauns, Arch. Nat. Meckl. 1889, p. 83; Kokujew, Horae Soc. Ent. Ross. 1899, p. 133, ♂ ♀; cf. Poulton, Tr. Ent. Soc. 1886, p. 162 et 1888, p. 588.

A large, lighter or darker rufescent-testaceous species. Head posteriorly strongly buccate and as broad as eyes; vertex not narrow, with ocellar region black. Antennae about as long as body, with their apical two-thirds nigrescent. Mesonotum very finely punctate throughout and not strongly nitidulous; metathorax more or less distinctly transaculate, with its apical transcarina laterally entire. Scutellum broad and laterally carinate to extreme apex. Terebra black and as long as the decidedly stout basal segment. Stigma dark testaceous; areolet more or less petiolate, apically incomplete below; nervelet obsolete or wanting. Length, 12-19 (-22 abroad) mm.



Instantly known by the broad temples and usually large size. This is very probably the *P. inquinatus*, taken by Hope at Netley, but Gravenhorst's description is inadequate. It is quite certainly the *Ophion Vinulae* of Stephens (Cat. 1829, 351) and it is open to question whether his name, used in conjunction with the excellent figure to which he refers should not stand: this is Albin's Nat. Hist. Engl. Ins. 1720, pl. xi, which repre-

sents *Paniscus cephalotes* emerged from *Dicranura vinula*, together with a bundle of five of the former's cocoons.

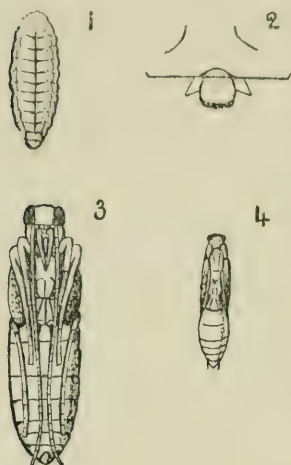
Its life history is one of the best known and most easily observed among Ichneumonidae. E. W. Andrews (Entom. 1882, p. 163, cf. p. 239) found a few little black and shining objects* hidden between the rolls of skin behind the head of *D. vinula* larvae (and I too have frequently seen such); these were firmly embedded in the body, only half of each being visible, like an egg in the egg-cup. This was on 14th June, and about a fortnight later one hatched, and the rest soon followed. The ensuing larvae were fat, apodous, greenish-white and semitransparent, attached by both extremities to their hosts and swaying about at every movement. The parasites remained external. Most of the caterpillars were too weakened by suction to pupate, but one survived sufficiently to spin its cocoon towards the end of August. The perfected parasites emerged (apparently simultaneously) on 19th May. Schmiedeknecht says the young maggots bore into the host's body; he infers that in the case of the smaller hosts the parasitism is solitary.

On August 14th, 1900, Wigin sent from Methley in Yorks three cocoons of *D. vinula* to me. The first was stout and fully constructed; it contained (like Albin's) five jet-black, hairy, leathery cylindrical cocoons (as figured in Insect Arch. 326), spun upon each other longitudinally and upon the walls of the host-cocoon loosely by strands; one black cocoon I opened and found a larva in every respect resembling that described below, though somewhat larger; this I replaced and these with their—? own—cast skins and that of the empty host-larva, all at one extremity, occupied the whole cocoon. From it emerged four males and one female between the 3rd and 6th June, 1901; one male being out by 10 a.m. and a second emerging between 1 and 4 p.m. The second cocoon was a thin and fragile one, as though the caterpillar had had but little vitality for its construction; it contained nine cocoons woven upon each other of a sordid white, very unlike the first lot in colour, the lower being even paler than the upper ones; these, on account of their number, were smaller than those of the first lot and much thinner in texture, though similar in shape. They contained larvae like the first ones though with less dull markings, probably on account of less development. From this cocoon emerged four males and two females between 2nd and 4th June, 1901; one male and two females being out by 10 a.m. on 3rd, and another male between 1 and 4 p.m. the same day. Of the remaining three specimens, two died as larvae and one failed to emerge, though a fully-formed imago. The third cocoon was also somewhat fragile, containing a dead and rather shrivelled, though still soft, host-caterpillar with three live and active larvae of the parasite still feeding upon it, one of which is described below and may be considered fully fed. One of these larvae had become a dirty grey-green slate-colour on 19th, and all subsequently died.

The larva (see fig.) is 18 mm. in length when crawling, and 10 mm. at rest; 5 mm. in breadth at its broadest part; with a distinctly discreted, explanate, fleshy lateral border, containing no visible spiracles. It is entirely pale, primrose-white, and diaphanous; a great number of lighter

* These eggs appear to have been mistaken for pupae on *Dicranura furcula* (E.M.M. xx, p. 227) and for small beetles (Entom. xi, p. 251); they are well figured at *lib. cit.* 1884, pl. ii, fig. 19 and *in situ*, fig. 16.

opaque granules being observable subcutaneously. There are thirteen segments of which the first or head has the outlines of the mouth-organs (see fig.) brick-red, together with an impressed lateral streak reaching nearly to the base of the segment on either side (these oblique streaks, which I failed to detect in larvae not fully fed, appear to represent eyes); these are the only larval markings. The segments are somewhat arcuate dorsally and progress is effected by wriggling, the mouth probably being employed as a fulcrum. One wriggled perpetually for an hour. The anus is constantly a little deflexed and the insect appears incapable of lying flat upon its ventral surface. I watched one larva spinning its cocoon with its mouth.



1 Larva. 2 Mouth organs.
3, 4 Pupa.

The pupa (see fig.) has little power of motion, being capable only of a restricted transverse or circular movement of the abdomen. Dorsally it is fulvous, with the occiput and a longitudinal dot at base of hind tegulae black; the sides of the abdomen are basally flavous; the eighth segment bears a most peculiar proleg dorsally in its centre. Ventrally it has the thorax, external orbits and legs, except tarsi, fulvous; the tarsi, frons, face, clypeus and abdomen, flavous; eyes, wings and antennae infusate, with base of wings flavous, of antennae fulvous; the onychii and mandibular apex are infusate. The legs are folded back upon their femora, the petiole partly upon the petiolar area; the head is deflexed with antennae, which extend very slightly beyond anus, and all the palpi stretched straight out.

On September 15th, 1901, Wigin sent another cocoon of this host, which though complete was not normally stout; the black *Panisci*-cocoon entirely occupied its interior, except one end where were pushed the host's skin and corneous head—one female parasite in attempting an exit at that end had subsequently died in statu quo—and the five cocoons were woven upon each other so closely as to be difficult of extrication. Two other larvae had died, one of mould and the other was still soft and black, when received. A single pair only emerged on 5th and 22nd June following. That they do not always emerge the next season, however, is proved by three living and healthy *Paniscus* larvae (together with one dead and soft larva, a dead and mouldy larva, and a dead nymph) on the 18th December, 1902, in a cocoon of the same host, received from Methley on 14th October, 1901.

It is very common in Britain, though rarely taken in the field; in 1908 Dr. S. B. Stedman sent me both sexes from the same sort of cocoon, with a single female *Pimpla instigator*, saying "These two species apparently nearly exterminated *D. vinula* round here—Market Rasen in Lincs.—in 1907. In that autumn all the pupae I found contained them, and all the larvae I obtained that season also." There are records from this host by Eedle, Bridgman (Entom. 1880, p. 68), Wilson (*l.c.* 1881, p. 139), Sotheby (*l.c.* 1883, p. 65), Holmgren originally bred it therefrom in Sweden; and

in Prussia Brischke records it thence, as well as from *Pocilloampa populi*, *Acronycta tridens*, *psi* and *megacephala*, *Cucullia asteris*, *abrotani* (*artemisiae*), *argentea*, *scrophulariae*, *thapsiphaga* and *balsamita*. It does not appear wide-spread on the Continent, though Gaulle records it from France. With us Baker once bred it from *Dicranura bifida* (Entom. 1883, p. 65) and Bridg.-Fitch—possibly in error—add *Orgyia pudibunda* (*l.c.* 1885, p. 14). Mrs. Holmes has given me a female from *Smerinthus populi* bred in Cornwall during 1908; and another from the same host or *S. ocellatus* at Sevenoaks in Kent, during the same year. I possess it from Guestling (Bloomfield), Hastings (Esam), Bristol (Charbonnier), Tooting Bee Road (Sparke) and have bred it from its usual host at Epsom in 1889 (Science Gossip, 1893, p. 38) and Ipswich. It is recorded from Lee in Kent (Insect Arch. 325); Yorks, Norfolk, Devon, etc.

ABSYRTUS, Holmgren.

Holmgr. Sv. Ak. Handl. 1858, p. 321; Ofv. 1858, p. 323.

Species mainly testaceous. Head transverse and hardly buccate; clypeus discreted, apically broadly rounded; mandibles moderately broad, with the lower tooth the longer; palpi filiform and subelongate; eyes slightly emarginate next the scrobes; ocelli large, face deplanate. Antennae slender and filiform, with scape very little excised, obliquely truncate. Thorax narrower than head; pleurae glabrous, nitidulous and not transimpressed; metathorax with spiracles subrotund and areae subobsolete with only traces of apical carinae. Scutellum convex and apically rounded. Abdomen petiolate, of ♀ a little compressed; basal segment straight, laterally margined, about a third length of abdomen, with spiracles between centre and base. Legs slender with the tarsal claws small, pectinate or internally rigidly setose.

This genus is best known by the lower mandibular tooth being distinctly longer than the upper; the wing is figured in Genera Insectorum, 1911, pl. ii, fig. 18.

1. *luteus*, Holmgr.

Absyrtus luteus, Holmgr. Ofv. 1858, p. 323; Sv. Ak. Handl. 1858, p. 33; Bridg.-Fitch, Entom. 1885, p. 15; Schm. Opusc. Ichn. p. 1846, ♂ ♀.

A fulvous-testaceous species, with very sparse black markings. Head but slightly constricted posteriorly behind the oblong and nigrescent eyes, the space between which and the scrobes is very narrow; cheeks not buccate; ocelli and mandibular apices nigrescent. Antennae filiform, as long as or somewhat longer than body, gradually attenuate and finely pilose towards their apices. Thorax narrower than head, smooth with a nigrescent subradical mark; metathorax with obsolete areae. Abdomen subpubescent; basal segment straight, about as long as coxae and trochanters, and apically gradually subexplanate; terebra of ♀ short, hardly exerted. Legs slender with hind coxae, subelongate and subcylindrical; calcaria not extending to metatarsal centre. Wings subample and slightly flavescent, with radial cell elongate and both abscissae of radius straight; areolet irregular and complete, emitting recurrent nervure almost from its apex; nervellus postfurcal, intercepted a little above its centre. Length, 7–12 mm.

Not very frequent among grass and undergrowth in Sweden (Holmgr.), both sexes in Prussia (Brischke), Zante and very common in Thuringia in late summer in grassy and rather damp places, especially among alders (Schm.), France (Gaulle), Zurich (Buchecker), Belgium in July and August (Tosq.). Bridg-Fitch showed no personal acquaintance with it in 1885, though Harwood records it from Essex (Vict. Hist.); the former did not find it in Norfolk, but Bignell, who took it at Bickleigh as early as 16th June, terms it (Devon. Assoc. 1898, p. 488) as a "common species." If Schmiedeknecht did not profess to know both well, I should have suspected synonymy of *Paniscus latungula*, whose spiracles are nearly circular, with the present insect, which Thomson nowhere mentions. I find nothing in the descriptions of authors to render it distinct from *Prionopoda stictica*, Fab., except the elongate lower mandibular tooth. It has not yet been bred. There are examples in my collection from the New Forest, Wyre Forest, Shere in Surrey, Guestling in Sussex, Totnes, and taken by Rev. W. F. Johnson at Poyntzpass in Co. Armagh in October.

TRIBE

MESOCHORIDES.

Strongly glabrous and nitidulous insects, usually of small size. Head short and nearly always posteriorly constricted; eyes internally emarginate with ocelli large. Antennae rarely at all shorter than body, slender and slightly setaceous. Thorax convex and often coarctate, with notauli distinct though not deeply impressed; metathorax hardly punctate with all the areae strong and complete though finely costate; petiolar area usually entire with its central a little longer than lateral areae; areola elongate, subpentagonal with costulae obvious. Scutellum subconvex, rarely with an apical knob or granule. Abdomen very distinctly petiolate, laterally compressed towards its anus, though much less so than in the majority of the present subfamily; petiolar spiracles at or a little beyond centre of basal segment; hypopygium large and strongly prominent; terebra about as long as basal segment; ♂ with two elongate, styloid anal appendages, liable to be mistaken for the terebra. Legs slender; claws and pulvilli small, with the former nearly always more or less broadly and elongately pectinate. Wings with the areolet rhomboidal quadrate, always conspicuously large and rarely obviously broader than the subcentrally emitted recurrent nervure; basal and disco-cubital nervures strongly curved; stigma somewhat broad and not elongate; nervellus more often wanting.

This Tribe is at once recognised by the unique shape and size of its areolet, the nitidulous body and curious ♂ anal styls. Its position has hitherto been a moot point; Thomson in his *Notes hymenopterologiques* of 1885 assigns it none; Szépligeti in *Genera Insectorum* raises it to the dignity of a subfamily; and Schm. considers that in habitus these insects approach the Banchides, adding that they are also allied to the Paniscides, though distinguished from both groups mainly by the position of the petiolar spiracles. That the last is their correct position I have been enabled to prove to my own satisfaction, by the discovery of a new and intermediate genus, *Tetragonalys*, Morl., of two species from Sikkim and Victoria, attacking Lepidoptera and combining to a remarkable degree the main features of *Paniscus* and *Mesochorus* of Gravenhorst. This author described eight species of the latter genus, and Ratzeburg vaguely sketched fifteen more; in 1880 Brischke brought forward a good many from Prussia, which are not treated of in Thomson's work, referred to above, in which he enumerates sixty-two kinds, after breaking up the group into the three genera here adopted. He considered *M. alarius* incorrectly placed in this Tribe and Dalla Torre, consequently, inserts it next after *Paniscus*; I consider Schm. so justified in reinstating it here that in our "limited fauna," it is sufficiently congruous in *Astiphrommus*. To this genus also obviously belongs Haliday's *M. atricilla*,* on account of his "alarum posticorum nervo anali discreto"; it is $0\frac{1}{2}$ lines in length, testaceous with head and anus black, but I have seen nothing like it; he found both sexes (*Ann. Nat. Hist.* 1839, p. 114) at Holywood in August and September; and I expect *Plesiophthalmus melanocephalus*, Habermehl (*Deut. Ent. Zeit.* 1909, p. 566, ♂), must be synonymised with it.

*The type appears to be lost for, when working through Haliday's collection in the Dublin Museum in July, 1913 (*cf. Entom.* 1913, p. 261), I failed to find it either indicated or selectable.

Most of the five species Haliday there describes are now well known, though I have had to omit *M. arenarius*, taken on *Salix argentea* at Portmarnock in Co. Dublin during June and subsequently recorded only by Bignell from Longbridge in Devon on 27th of the same month. Nor do I understand what Curtis intended to convey (Brit. Ent.) by his two *Astiphrommi*, *M. splenium* and *M. sericans*, though Bridgman was more fortunate, for Bignell tells us that he bred the latter, which is probably *A. mandibularis*, Thoms., "from a dipterous pupa, probably *Exorista vulgaris*, out of *Abra-xas grossulariata*" (Devon List); adding that it is hyperparasitic on the larvae of the Tachinidae, and does not consume its victim until after it has changed into pupa; therefore there cannot be any doubt that it is hyperparasitic (Entom. 1880, p. 246; to these observations Fitch adds a query at *l.c.* 1881, p. 141). Two other species, *M. ater*, Ratz. and *M. splendidulus*, Grav., have long stood in the British list; the former was raised from *Lasiocampa pini* and *Clisiocampa neustria* in Germany, but has not been since noticed; the latter seems one of those compound names, so often passed in silence because nothing definite can now be said of them, and is recorded by the older authors from several localities in central Europe; Vienna (Kirchner), bred from *Depressaria applanella* and from *Microgaster perspicuus* through *Porthesia auriflua* (Giraud, 1877), hyperparasitically from *Sphinx populi* through *Microplitis ocellatae* (Ratz. ii. 48 et Marsh. Bracon. d'Europ. i. 499), and in France from *Hyponomeuta*, *Apanteles*, *Microgaster* and *Cimbex* species, as well as from eggs of the spider, *Salticus* (Gaulle). In all probability our claim to it rests on Gravenhorst's note (I.E. i. 717) upon Hope's capture of var. 6 at Netley, but this refers to *M. strenuus* only: Curtis' Irish record and Parfitt's from Alphington (Cat. Ichn. Devon) may do the same. Excluding such doubtful names as the above over eighty species of this tribe are recognised in the European fauna and I cannot think this too great a number, when one remembers that a large proportion of the Braconids, especially the Areolari, are destroyed by these consequently injurious Ichneumonids. Haliday possessed twenty-six "very distinct" kinds, says Curtis in 1833.

I shall treat of our species under three genera only.

Table of Genera.

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|------|----|---|---------|-----------------------|
| (2). | 1. | Nervellus always intercepted; parallel nervure emitted from centre of brachial cell | | ASTIPHROMMUS, Thoms. |
| (1). | 2. | Nervellus never intercepted; parallel nervure not emitted from centre of brachial cell. | | |
| (4). | 3. | Scutellar fovea broad and deep; parallel emitted above centre of brachial cell | | MESOCHORUS, Grav. |
| (3). | 4. | Scutellar fovea transversely linear; parallel emitted below centre of brachial cell | | STICTOPISTHUS, Thoms. |

ASTIPHROMMUS, Thomson.

Thoms. Ann. Soc. Ent. Fr. 1885, p. 327; (?) *Astiphromma*, Först. Ver. pr. Rheinl. 1868, p. 170.

Head with the genal sulcus wanting; upper wings with the parallel nervure usually emitted from centre of the brachial cell; and the lower with the nervellus very nearly always intercepted. Frons entirely black

above scrobes, face equally black or with whitish markings but with the orbits not determinately pale; ♂ face always pale. Thorax with the lateral metanotal costae often basally wanting. Abdomen discally shortly pubescent, with the postpetiole laterally margined in both sexes. Wings with the lower basal nervure often postfurcal, the parallel nervure nearly always emitted from centre of brachial cell, which has the lower apical angle acute; nervellus always or nearly always more or less distinctly intercepted.

Table of Species.

- | | | |
|-------|--|--------------------------------|
| (2). | 1. Vertex narrow; ocelli contiguous with eyes; unicolorous testaceous .. | 1. ALARIUS, <i>Grav.</i> |
| (1). | 2. Vertex normal; ocelli remote from eyes; body broadly black. | |
| (6). | 3. Scutellum with an apical tubercle or granule; face of ♀ black. | |
| (5). | 4. Pleurae neither punctate nor red; vertex stouter; terebra shorter .. | 2. DORSALIS, <i>Holmg.</i> |
| (4). | 5. Pleurae punctate and partly red; vertex less stout; terebra longer .. | 3. GRANIGER, <i>Thoms.</i> |
| (3). | 6. Scutellum smooth, with no apical granule; face of ♀ often pale. | |
| (8). | 7. Lower mandibular tooth distinctly the longer | 4. MANDIBULARIS, <i>Thoms.</i> |
| (7). | 8. Lower mandibular tooth not longer than the upper. | |
| (13). | 10. Body very stout; face of ♀ black. | |
| (12). | 11. Lower basal nervure elongately postfurcal; abdomen, except basally, pale | 5. STRENUUS, <i>Holmgr.</i> |
| (11). | 12. Basal nervure subcontinuous; abdomen nearly entirely black .. | 6. SCUTELLATUS, <i>Grav.</i> |
| (10). | 13. Body more slender; face of both sexes flavidous. | |
| (15). | 14. Lower basal nervure not continuous, strongly postfurcal | 7. HAMULUS, <i>Thoms.</i> |
| (14). | 15. Basal nervure subcontinuous through the median. | |
| (17). | 16. Nervellus of hind wing weakly but distinctly intercepted | 8. PICTUS, <i>Brisch.</i> |
| (16). | 17. Nervellus of the hind wing not at all intercepted. | |
| (19). | 18. Scutellum black; hind tibiae not nigrescent | 9. TENUICORNIS, <i>Thoms.</i> |
| (18). | 19. Scutellum red; apices of hind tibiae broadly nigrescent | 10. PLAGIATUS, <i>Thoms.</i> |

1. *alarius*, *Grav.*

Mesochorus alarius, Gr. I.E. ii. 977, ♂. *M. gigas*, Kriech. Ent. Nachr. xxiii, p. 332, ♀. *M. (Plesiophthalmus) alarius*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 183, ♂ ♀. *Cidaphus alarius*, Brauns, Arch. Nat. Meckl. 1889, p. 78; *P. alarius*, Schm. Opusc. Ichn. 1940, ♂ ♀.

A shining and entirely testaceous species with only the ocellar region and mandibular apices black; anus of ♂ subinfusate. Head small and very strongly constricted posteriorly with the face uneven and strongly punctate, dull and triangularly prominent centrally with an impression above the clypeus. Antennal scrobes deeply impressed. Thorax with

the notauli apically somewhat broad and deeply impressed; mesonotum finely and sparsely punctate, feebly nitidulous; metathorax shining and subglabrous with spiracles elongate and all the costae strong; areola subtriangular and apically strongly carinate, basally acuminate and confluent with basal area. Abdomen nitidulous and narrower than thorax, very finely and diffusely substriate; basal segment not sulcate; terebra as long as the third segment, with valvulae very broad and apically subconstricted. Legs not short, claws strongly and elongately pectinate to apex. Wings hyaline with areolet rectangular, distinctly petiolate and apically obliquely truncate; nervellus a little antefurcal and strongly intercepted distinctly below its centre. Length, 10–15 mm.

This distinct species, which has the colour and onychial pectination of *Paniscus*, is scattered through central Europe, occurring rarely nearly every year in Thuringia. It was originally found on umbelliferae near Gottingen in July, subsequently by Kriechbaumer in the Tyrol, and Brischke bred one in Prussia from a cocoon of *Campoplex mixtus* through the larva of *Catocala nupta*. It is very rarely found in Britain and there are no records, though Desvignes says it was in the British Museum in 1856. I possess three examples; the female was found at Ketton near Stamford in Rutland on 14th May, 1909, by Rollason; a male taken at Lyndhurst in the New Forest during June, 1907, by Adams; and there is another in Capron's collection from Shere in Surrey.

2. *dorsalis*, Holmgr.

Mesochorus dorsalis, Holmgr. Sv. Ak. Handl. 1858, p. 117, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 180, ♀. *M. scutellatus*, Brisch. l.c. p. 179, ♂ ♀ (*nec* Grav.). *M. hirsutus*, Bridg. Trans. Ent. Soc. 1883, p. 168, ♂ ♀. *Astiphrommus dorsalis*, Thoms. Ann. Soc. Ent. Fr. 1885, p. 328, ♂ ♀.

A stout, black species with the head anteriorly and the legs pale, hind tibiae and tarsi infusate. Head very slightly and evenly constricted behind the eyes; vertex somewhat broad, stout and broadly emarginate; cheeks buccate and hardly shorter than base of the stout, short and apically hardly constricted mandibles, which have equal teeth; ♀ with palpi, mandibles except apically, clypeus and apices of cheeks flavidous, head of ♂ anteriorly entirely pale. Antennae black or piceous, basally paler beneath. Thorax short and coarctate, often with the disc and sternum pale red; the frequently concolorous pleurae subglabrous; prothorax of ♂ flavescent; petiolar a little longer than its lateral areae, nearly transverse; areola broad, apically complete and emitting the often obsolete costulae before its centre. Scutellum partly or entirely red, and apically granulate. Abdomen hardly longer than head and thorax with apical margin of second segment whitish flavous; ventral anal segments centrally pale; petiole narrow and the two following segments of ♀ somewhat transverse, of ♂ subquadrate. Legs, except apices of the hind ones, stramineous with the anterior of ♂ basally paler; hind tarsi incrassate, their claws stout and extending beyond the pulvilli, closely and elongately pectinate nearly to centre, and subrectangularly deflexed. Wings nearly hyaline, with areolet somewhat large; tegulae of ♂ whitish; stigma infusate or dull testaceous, not broad, emitting the apically straight radius nearly from its centre; lower basal nerve postfurcal, parallel nervure emitted from centre of brachial cell, lower angle of discoidal cell apically acute; nervellus intercepted obviously below its centre. Length, 8–10 mm.

The female is usually the darker sex, with the scutellum but sparsely red-marked and face black.

It is a rare species, though widely distributed, throughout north and central Europe. Bignell records it from Bickleigh in Devon in the middle of August (*cf.* Tr. Ent. Soc. 1886, p. 353); the type of Bridgman's name was taken about Shere in Surrey by Dr. Capron, but is not now (at least so-labelled) in his collection, where I possess two co-typical males and one female from that neighbourhood.

3. *graniger*, Thoms.

Astiphrommus graniger, Thoms. Ann. Soc. Ent. Fr. 1885, p. 328, ♂ ♀.

A black species with flavidous-stramineous legs, the head narrow behind eyes, and both scutellum and pleurae punctate and in part rosy. Length, 8-9 mm.

The only species of this genus resembling *A. dorsalis* in its apical scutellar granule and flavidous-margined second segment; but with the body less coarctate, the cheeks not buccate, mandibles apically constricted, vertex less stout, the thorax darker with pleurae obviously punctate and lateral costae of metanotum not basally obsolete, terebra longer, hind tarsi more slender with the less stout claws evenly curved.

At present only known from Sweden and France (Thomson); and Holland, where it occurs in May and July (van Burgst). In Britain, it was first bred in Devonshire from *Abraxas grossulariata* through *Exorista vulgaris* (Bignell; *cf.* Tr. Ent. Soc. 1886, p. 354). The only example I possess was captured at Bickleigh Vale in the same county on 16th June, 1897, by Beaumont.

4. *mandibularis*, Thoms.

Astiphrommus mandibularis, Thoms. Ann. Soc. Ent. Fr. 1885, p. 330, ♂ ♀.

A black species with a discal abdominal plaga, and the legs, flavidous testaceous; mandibles with the lower tooth the longer. Head partly pale, as broad as thorax and evenly rounded behind the eyes; vertex not very narrow, face subtransverse and somewhat strongly punctate; clypeus transversely impressed before its apex, with deep lateral foveae; cheeks neither elongate nor compressed; mandibles somewhat long and stout, slightly curved, with lower tooth the longer. Antennae nearly as long as body, setaceous and pale pilose; testaceous and becoming darker above towards their base. Thorax elongate and densely pubescent, black and sometimes with a discal central mark and the sternum castaneous; petiolar area short, areola narrow and emitting costulae far before its centre; lateral costae not basally obsolete. Scutellum sometimes castaneous. Abdomen elongate, densely pilose and black with a central plaga on disc of second and third segments, with the ventral plica, stramineous. Legs not very stout, flavidous-stramineous with the hind coxae sometimes externally dark basally; apex of tibiae subdilated or reflexed; metatarsus apically spinulose, claws longer than pulvilli and basally hardly pectinate. Wings hyaline, with lower basal nervure elongately postfurcal; parallel nervure emitted from centre of the apically acute brachial cell; nervellus suboblique and intercepted far below its centre. Length, 7-9 mm.

Thomson says the face of both sexes is pale, but in all my females only the mouth is flavous with cheeks and clypeus rufescent. This species somewhat resembles *Mesochorus vitticollis*, but is distinct in its strong nervellus, and from its allies in the extraordinary length of the lower mandibular tooth.

It was described from Sweden, and I introduced it as British ten years ago. During 1900 and 1901 I bred a great many specimens of both sexes from the thousand cocoons of *Exetastes cinctipes* which at that time passed through my hands (cf. Ichn. Brit. iii. 294 et E.M.M. 1903, pp. 157-164); it is undoubtedly hyperparasitic through this Banchid upon such common Noctuae as *Mamestra brassicae* and *Hadena oleracea*, and emerges through an irregularly excised orifice a little on one side of the apex of the *Exetastes* cocoon, within which its pupa lies free. I have never met with this species on the wing and all my examples are from the neighbourhood of Leeds in Yorkshire.

5. *strenuus*, Holmgr.

Mesochorus splendidulus, var. 6, Gr. I.E. ii. 969, cf. i. Suppl. 717, ♀. *M. strenuus*, Holmgr. Sv. Ak. Handl. 1858, p. 119; Brisch. Schr. Nat. Ges. Danz. 1880, p. 180, ♂ ♀. *Astiphrommus strenuus*, Thoms. Ann. Soc. Ent. Fr. 1885, p. 329, ♂ ♀.

A black species with the abdomen except basally and the legs stramineous-testaceous, the latter partly infusate, lateral metathoracic costae basally obsolete and, in ♂, the pleurae and central abdominal plaga stramineous. Head transverse and posteriorly constricted, with vertex narrow; frons glabrous, nitidulous and laterally impressed; face subprominent, punctate and in ♀ transverse; mandibular teeth of equal length; mandibles except apically and clypeal margin of ♀ pale; ♂ with face, clypeus, mouth and cheeks flavidous. Antennae somewhat stout and longer than the body, rufescent and basally paler. Thorax stout with radical callosities and another below wings rufescent in ♀; of ♂ rufescent beneath, with prosternum whitish; pleurae centrally smooth and shining; metathorax with complete upper arcae, lateral costae basally obsolete, petiolar area short and areola narrow. Scutellum of ♂ often subrufescent-marked. Abdomen hardly longer than head and thorax, smooth and shining, black and of ♂ with a central whitish vitta; of ♀ with the third and following segments usually entirely testaceous, the second triangularly flavidous from apical angles to disc; petiole not broad; second and third segments of equal length and slightly longer than broad; gastrocoeli distinct; terebra stout and hardly shorter than basal segment. Legs pale flavous with apices of hind tibiae somewhat broadly nigrescent, their femora apically and sometimes the coxal base infusate; claws short and pectinate. Wings with areolet very shortly petiolate, emitting recurrent nervure from its centre; radius apically straight; stigma dull testaceous, lower basal nervure elongately postfurcal; parallel nervure emitted from centre of brachial cell; nervellus intercepted below its centre. Length, 8-10 mm.

North and central Europe: common in Thuringia; bred in Prussia from *Eupithecia actaeata* and a species of *Cucullia*; and in France from both *Campoplex brevicornis* and *C. falcator*; in Belgium it is said to occur in July. One of the earliest species recorded from Britain, since Graven-

horst tells us (I.E. i. 717) that Hope took it about Netley in Shropshire; more recently it is recorded from Bickleigh in Devon during August (Bignell); Shere in 1879 (Capron, Entom. 1880, p. 89); bred from *Taenio-campa stabilis* through *Spudastica Kriechbaumeri* (Buckler). It cannot be common with us for I possess but three females in Capron's collection, and one captured by Stanley Edwards at Lynton in Devon during 1890.

6. *scutellatus*, Grav.

Mesochorus scutellatus, Gr. I.E. ii. 973, ♂; Ratz. Ichn. d. Forst. ii. 111, ♂ ♀ (nec Brisch.). *M. festivus*, Holmgr. Sv. Ak. Handl. 1858, p. 121, ♂ ♀. *Astiphrommus scutellatus*, Thoms. Ann. Soc. Ent. Fr. 1885, p. 320, ♂ ♀.

A black species with the scutellum and pleurae sanguineous, the legs fulvous with hind tarsi and their tibial apices nigrescent, and the lateral metanotal costae basally obsolete. Head slightly constricted behind eyes; face transverse and densely punctate: of ♀ with palpi and mandibles except apically stramineous; of ♂ with the clypeus, face and genal apices concolorous. Antennae as long as body, nigrescent and slightly paler beneath. Thorax with pleural marks red in ♀, prothorax apically and callosities below radices whitish in ♂ with most of the sternum red; metathorax with complete upper areae; areola usually incomplete at its apex. Scutellum red. Abdomen black with apex of second segment triangularly rufescent, and most of the third and fourth rarely concolorous; second segment not longer than broad and third subtransverse. Legs fulvous with the hind tarsi and apices of their tibiae infusate. Wings subhyaline, with stigma piceous and tegulae whitish; basal nervure subcontinuous through the median; nervellus nearly always intercepted. Length, 6-8 mm.

Known by the entirely or partly red mesopleurae and scutellum, the subelongate face and cheeks and hind calcaria, the subacute lower angle of the discoidal cell, at most but the apical margin of the second segment pale, and the sometimes nearly continuous lower basal nervure.

North and central Europe; bred in France from *Croesus latipes* (Gaulle) and in Germany from *Lophyrus pini* (Ratz.); taken at Breda in Holland during August (Burgst). It is said to have been represented in the British Museum collection so long ago as 1850 by Desvignes and has figured in our subsequent catalogues, but there are no more recent records and I have not met with indigenous examples.

7. *hamulus*, Thoms.

Astiphrommus hamulus, Thoms. Ann. Soc. Ent. France, 1885, p. 330, ♂ ♀.

A black species with the legs pale, mesonotal marks citrinous, and the basal nervure subcontinuous. Head with cheeks broadly stramineous; mandibular teeth of equal length. Thorax with mesonotal lines before tegulae pale sulphureous, each emitting branches towards the disc; mesosternum with a pale line on either side; lateral metanotal costae complete, areola narrow and emitting costulae far before its centre, petiolar area small and nearly transverse. Abdomen with petiole somewhat broad and not elongate; immaculate black, with at most third segment of ♂ narrowly testaceous at its base. Legs somewhat stout and testaceous with apices of the hind tibiae hardly infusate; claws small

and but slightly pectinate. Wings with stigma not broad, lower basal nervure but slightly postfurcal, and parallel nervure emitted from centre of brachial cell. Length, 6 mm.

Hitherto only known from Denmark; but I possess a male found by Capron at Shere.

8. *pictus*, *Brisch.*

Mesochorus pictus, Brisch. Schr. Nat. Ges. Danz. 1880, p. 186; Bridg. Trans. Ent. Soc. 1886, p. 353, ♂. *Astiphrommus incidens*, Thoms. Ann. Soc. Ent. Fr. 1885, p. 331, ♂ ♀.

A black species with scutellum and pectoral mark sanguineous, legs pale flavidous red, apices of the anal segments somewhat broadly and laterally interruptedly whitish, and the basal nervure continuous. Head cubical with the cheeks somewhat broadly, palpi, clypeus, frontal orbits and ♂ face whitish; vertex broad and posteriorly emarginate; face apically explanate and mandibles broad. Antennae piceous, subsetaceous, not slender, basally black. Thorax not coarctate; pro- and meso-notum rosy, with two slender vittae paler; mesopleurae evenly punctate, sanguineous with a black mark below radices, a line below and callosity beneath radices whitish; metathoracic carinae complete. Scutellum red. Abdomen elongate and apically compressed, with dense pubescence; basal segment very closely punctate, postpetiole margined and sulcate, second and third segments longer than broad; the apical margin of second, and apical marks on third to sixth with lateral lines, white; terebra only half length of first segment. Legs pale fulvous and not slender, with the anterior basally stramineous; an apical mark on hind coxae, their tibial apices and slender tarsi nigrescent, with joints of ♂ basally white; claws short and pectinate. Wings hyaline with basal nervure continuous through median, parallel nervure emitted nearly from centre of brachial cell, discoidal cell subrectangular below and nervellus hardly intercepted. Length, 6–8 mm.

Brischke described it from Königsberg; Thomson only knew it from England; and Schm., who synonymises the names, has recently taken it in Thuringia. It was introduced as British on the strength of examples taken by Harwood near Colchester, by Bridgman (Trans. Ent. Soc. 1886, p. 353), who did not recognise an indigenous female of Thomson's species—named by its author (*l.c.*)—as synonymous.

9. *tenuicornis*, *Thoms.*

Astiphrommus tenuicornis, Thoms. Ann. Soc. Ent. France, 1885, p. 332, ♂ ♀.

Slender and black with the legs, anus and a central abdominal plaga stramineous; basal nervure continuous through the median, and basal metanotal costae complete. Head with the vertex narrow; antennae elongate with the flagellum slender and filiform. Thorax with the metathoracic basal costae complete; sternum smooth, laterally stramineous, centrally white and ferrugineous above. Scutellum black. Abdomen with the apical margin of second segment more broadly centrally, and a central vitta on third and fourth with whole of the following, flavidous stramineous; terebra black. Legs stramineous with a black basal dot on hind tibiae; the slender and submutic claws small and not extending beyond pulvilli; calcaria extending nearly to basal third of their metatarsi. Wings with areolet somewhat broad, emitting recurrent nervure

before its centre; basal nervure exactly continuous; parallel nervure emitted a little above centre of the not very acutely angled discoidal cell; nervellus not at all intercepted. Length, 5-6 mm.

Described from Sweden: Bridgman records it (Tr. Norf. Soc. 1894 *et* Tr. Ent. Soc. 1886, p. 354) from Lakenham in Norfolk during August.

10. *plagiatus*, Thoms.

Astiphrommus plagiatus, Thoms. Ann. Soc. Ent. France, 1885, p. 332, ♂ ♀.

Black with the mesosternum and legs stramineous, the apices of the hind tibiae somewhat broadly nigrescent, the metathoracic costae complete, and a central abdominal plaga broadly pale testaceous. Length, 5 mm.

Similar to *A. tenuicornis* in its colour, wings and slender conformation, but with apices of the hind tibiae somewhat broadly nigrescent and the scutellum red.

"Patria: Suecia, Anglia" (Thoms. *l.c.*); bred by Bignell from *Odontopera bidentata* in 1882 (Tr. Ent. Soc. 1886, p. 353) through *Apanteles juniperatae* (Buckler, vii). I have four Surrey males in Capron's collection: on 17th May, 1901, a warm sunless day, I beat another from young birch trees about seven feet high in Assington Thicks in south Suffolk; and I have seen others bred by Lyle in the New Forest hyperparasitically from *Calera pusaria* through *Campoplex forcipatus*.

MESOCHORUS, Gravenhorst.

Gr. I.E. ii (1829), 960; Thoms. Ann. Soc. France, 1885, p. 332.

Head with an impressed sulcus between the eyes and mandibular base; frontal orbits usually distinctly pale. Thorax with all the costae complete. Scutellum with its basal fovea somewhat broad. Abdominal post-petiole not often laterally margined, its disc nearly nude; anal styls apically obtuse, subcapitate and uncommonly subulate. Upper wings with the basal nervure usually continuous through the median and the parallel nervure always emitted above centre of the brachial cell; lower ones without any trace of nervellus.

As remarked in my notes under the present Tribe, several of the species described by both our, and the Continental, older authors are not yet satisfactorily synonymised; and some interesting work yet remains to be done in this direction by anyone fortunate enough to come at Haliday's types, which I have failed to find during a search through such of his collection as now remains in the Dublin Museum of Science and Art, or those of Curtis' British Entomology, the Hymenoptera of which need overhauling by our Australian cousins. I have met with no confirmation of Fitch's remark (Entom. 1880, p. 257) that it is "recorded, and has been observed in this country, that species of *Mesochorus* are external parasites on various insects"; he says they are certainly hyperparasitic on different Orders, meaning that they constantly prey upon other parasitic Hymenoptera, which themselves attack Diptera, Tenthredinidae and Coleoptera, but principally Lepidoptera. Little attention has been paid to this group, either here or abroad, and the following table comprises only such species as have been recorded.

Table of Species.

- | | | |
|-------|--|---------------------------------|
| (2). | 1. Scutellum with an acute and elevated apical granule | 1. POLITUS, <i>Grav.</i> |
| (1). | 2. Scutellum simple, with no apical granule. | |
| (4). | 3. Whole head, including the mouth, black; abdomen short | 2. NIGRIPES, <i>Ratz.</i> |
| (3). | 4. Head often broadly pale, mouth always pale; abdomen normal. | |
| (6). | 5. Petiolar area reaching metathoracic centre; frontal orbits distinctly rufescent | 3. TETRICUS, <i>Holmgr.</i> |
| (5). | 6. Petiolar area not reaching centre, or frontal orbits broadly white. | |
| (8). | 7. Frontal orbits broadly white; antennae slender, subfiliform | 4. TEMPORALIS, <i>Thoms.</i> |
| (7). | 8. Frontal orbits not pure white; antennae subsetaceous. | |
| (12). | 9. Body and legs unicolorous fulvous or rufescent. | |
| (11). | 10. Recurrent emitted before centre of areolet; unguiculi normal | 5. FULGURANS, <i>Curt.</i> |
| (10). | 11. Recurrent emitted from centre; unguiculi much stouter | 6. PECTINIPES, <i>Bridg.</i> |
| (9). | 12. Body variegated with more or less black and flavidous. | |
| (44). | 13. Size large or normal; terebra not subulate; petiolar spiracles central; basal nervure continuous; areolet not sessile. | |
| (17). | 14. Face quadrate; lower mandibular tooth longer than the upper. | |
| (16). | 15. Postpetiole not at all margined laterally; petiole black | 7. VITICOLLIS, <i>Holmgr.</i> |
| (15). | 16. Postpetiole submargined laterally; petiole testaceous | 8. TESTACEUS, <i>Grav.</i> |
| (14). | 17. Face transverse; mandibular teeth of equal length. | |
| (21). | 18. Claws submutic and longer than the pulvilli; tarsi not infusate. | |
| (20). | 19. Basal segment acutely elevated; thorax entirely black | 9. SEMIRUFUS, <i>Holmgr.</i> |
| (19). | 20. Basal segment not elevated; thorax at least partly red | 10. CONFUSUS, <i>Holmgr.</i> |
| (18). | 21. Claws pilose, at least basally pectinate, not longer than pulvilli. | |
| (39). | 22. Hind tarsi pale, rarely dull ferruginous; thorax usually pale. | |
| (30). | 23. Face of ♀ black, with the orbits alone pale. | |
| (27). | 24. Thorax entirely black; abdomen centrally rufescent. | |
| (26). | 25. Hind coxae dark; third segment basally pale | 11. FUSCICORNIS, <i>Brisch.</i> |
| (25). | 26. Hind coxae and whole of the third segment pale | 12. CRASSICRUS, <i>Thoms.</i> |
| (24). | 27. Thorax red-marked; abdomen not rufescent. | |

- (29). 28. Head narrowed to mouth; hind tibiae not basally black 13. THORACICUS, *Grav.*
 (28). 29. Head not apically constricted; hind tibiae basally black 14. SYLVARUM, *Curt.*
 (23). 30. Face of ♂ ♀ pale; abdomen of ♀ at least apically pale.
 (38). 31. Mesonotum neither whitish nor olivaceous-marked.
 (37). 32. Stigma not pale, nor petiole basally testaceous.
 (34). 33. Cheeks elongate and buccate; body not strongly elongate 15. DIMIDIATUS, *Holmgr.*
 (33). 34. Cheeks short and not buccate; body strongly elongate.
 (36). 35. Black with anus flavous; unguiculi explanate 16. CRASSIMANUS, *Holmgr.*
 (35). 36. Red with black markings; unguiculi not explanate 17. VITTATOR, *Holmgr.*
 (32). 37. Stigma pale; petiole basally testaceous 18. TENUISCAPUS, *Thoms.*
 (31). 38. Mesonotum whitish, with three olivaceous marks 19. PALLIDUS, *Brisch.*
 (22). 39. Hind tarsi nigrescent or obscurely infusate; thorax black.
 (43). 40. Flagellum black; orbits rufescent throughout.
 (42). 41. Petiole slender, half breadth of postpetiole; areolet sessile 20. PECTORALIS, *Ratz.*
 (41). 42. Petiole broad, little less than postpetiole; areolet petiolate. 21. BREVIPETIOLATUS, *Ratz.*
 (40). 43. Flagellum basally pale; at least frontal orbits whitish 22. TACHYPUS, *Holmgr.*
 (13). 44. Size small; terebra nearly subulate; petiolar spiracles often beyond centre; basal nervure rarely continuous; areolet sessile.
 (46). 45. Lower basal nervure antefurcal; face and cheeks not striate 23. ANOMALUS, *Holmgr.*
 (45). 46. Lower basal not antefurcal; face or cheeks usually striolate.
 (50). 47. Recurrent nervure emitted before centre of the sessile areolet.
 (49). 48. Cheeks elongate second segment at most apically pale 24. PICTILIS, *Holmgr.*
 (48). 49. Cheeks normal; second segment discally pale 25. FASCIALIS, *Bridg.*
 (47). 50. Recurrent nervure emitted from centre of petiolate areolet 26. ANGUSTATUS, *Thoms.*

1. politus, *Grav.*

Mesochorus politus, Gr. I.E. ii. 974; Ratz. Ichn. d. Forst. iii. 119; Holmgr. Sv. Ak. Handl. 1858, p. 122; Thoms. Ann. Soc. Fr. 1885, p. 333, ♂ ?; Brisch. Schr. Nat. Ges. Danz. 1880, p. 180, ♀; cf. *lib. cit.* 1888, p. 56.

A stout, shining, black species with the legs immaculate stramineous, the petiole basally infusate testaceous and scutellum apically tuberculate. Head transverse and but little constricted posteriorly, mouth pale; orbits red, the internal and in ♂ whole face entirely white; face quadrate,

punctate, centrally subelevated and impressed below scrobes; eyes internally slightly emarginate. Antennae slender and fully length of body, basally rufescent or piceous. Thorax stout, convex and finely punctate, usually with prothoracic margin and sternal sutures rufescent; metathorax short with complete upper areae; petiolar area longer at centre than at sides; areola not narrow, emitting costulae before its centre. Scutellum black, with an acute apical tubercle. Abdomen a little longer than head and thorax; black with first segment basally, apices of the two following narrowly and incisures of remainder, pale; basal segment somewhat broad and a little curved, with postpetiole more than double breadth of petiole, and the two following segments slightly broader than long; terebra and the subcapitate ♂ anal styls shorter than first segment. Legs somewhat stout, flavidous stramineous with anterior basally paler; the hind ones not black-marked. Wings hyaline, with stigma piceous and tegulae whitish; areolet large and emitting recurrent nervure before its centre; lower angle of discoidal cell acute, radius apically nearly straight, basal nervure subcontinuous. Length, 6–8 mm.

Our only species with tuberculate scutellum, which is said very rarely to be red.

North and central Europe: Belgium in July, France; Vienna and bred by Kawall from *Fidonia piniaria* (Kirchner); and raised from *Perichista melanocephala* (Giraud, 1877); but nowhere common (Schm.). Certainly a rare species with us: Eaton near Norwich in July (Bridg.); Bickleigh in Devon early in August (Bignell). Musham sent me a female bred from an unknown host at Lincoln on 26th May, 1902, and Hinde another bred from *Cymatophora ridens* at Norwich during 1908; the only example I have captured was swept from bushes in the Bentley Woods near Ipswich on 1st July, 1903. Lyle bred four *Tachinid* puparia from a larva of *Halijs prasinana*, each of which produced a single example of the present hyperparasite, in the New Forest.

2. *nigripes*, Ratz.

Mesochorus nigripes, Ratz. Ichn. d. Forst. iii. 119, ♂; Thoms. Ann. Soc. Fr. 1885, p. 333, ♂ ♀. *M. gibbulus*, Holmgr. Sv. Ak. Handl. 1854, p. 60, ♀; *lib. cit.* 1858, p. 124, ♂ ♀.

Small and black with the anterior legs nearly entirely rufescent and the whole head, including the mouth, black. Head not constricted behind the eyes, and black, with only the mandibles subpiceous centrally; face transverse and punctate, centrally subcarinate and slightly excavate above; mandibular teeth of equal length. Antennae as long as the body or nearly so. Thorax coarctate and stout, little longer than high and finely punctate; metathorax short with petiolar area reaching metathoracic centre, costulae emitted from centre of areola. Scutellum black and not tuberculate. Abdomen not longer than head and thorax, with the second segment apically rufescent and ventral plica flavous; basal segment slightly curved with postpetiole usually sulcate, the two following segments transverse and remainder very short; terebra not quite as long as basal segment and ♂ styls short. Legs rufescent with hind and often base of anterior femora, coxae, trochanters and apices of their tibiae black; all the tarsi piceous. Wings slightly infumate; stigma and tegulae testaceous; areolet of normal size, emitting recurrent nervure from its

centre; radius apically a little reflexed; basal nervure continuous. Length, 3-5 mm.

The only species with the whole head black, and legs unusually nigrescent.

A scarce species in north and central Europe; originally bred from *Phytonomus polygoni* in Prussia. Introduced as British (Trans. Ent. Soc. 1881, p. 162) on a Scottish specimen and taken at Lakenham in Norfolk during June (Bridg.); Bickleigh in Devon in the middle of July (Bignell); and bred from *Hypera variabilis*, through *Linnaea lugubrina*, by E. A. Butler (Entom. 1883, p. 67). I possess a nice series, comprising both sexes, in Dr. Capron's collection, presumably from Shere in Surrey.

3. *tetricus*, Holmgr.

Mesochorus tetricus, Holmgr. Sv. Ak. Handl. 1858, p. 122; Thoms. Ann. Soc. Fr. 1885, p. 334, ♂ ♀. (?) *M. basalis*, Curt. Brit. Ent. 464 (*nec* Cress.).

Black with the legs and centre of abdomen rufescent; terebra almost longer than petiole. Head posteriorly constricted with all the orbits distinctly though not broadly rufescent; cheeks not strongly compressed, mouth pale; face flavidous, transverse and punctate, of ♀ centrally infusate. Antennae somewhat elongate, with flagellar joints pale and a little discreted. Thorax stout and black with prothorax centrally and mesonotum, except three discal vittae, red; mesopleurae smooth; metathorax apically subtruncate, with complete upper areae; petiolar area large with its centre much longer than its sides, extending very nearly to metathoracic centre; areola large and broad, a little longer than broad and emitting costulae from its centre. Scutellum red. Abdomen not longer than head and thorax, black with apex of second segment flavous and the following sometimes obsoletely pale-marked; second and third segments transverse, and terebra a little longer than the first. Legs rufescent flavous, with the hind coxae and apices of their tibiae somewhat broadly nigrescent; claws distinctly pectinate. Wings hyaline with tegulae whitish; stigma broad and black, basally white-marked and emitting the apically hardly curved radius almost from its apical third; basal nervure continuous; areolet emitting recurrent nervure slightly before its centre. Length, 6 mm.

This is our only species, with pale mouth and simple scutellum, that has the petiolar area reaching centre of metathorax.

Sweden and central Europe. The first British example was bred near London from galls of *Cynips Kollari* (Fitch, Entom. 1880, p. 256); bred early in August from Yorks *Volodonta dromedarius* through *Apanteles octonarius* from Rev. C. D. Ash (Bignell, Devon List et E.M.M. 1897, p. 257). I possess half-a-dozen females of the latter breeding and consider them correctly named, though the colouration is throughout much paler than usually described; the head, mesothorax except its discal vittae, base and centre of the castaneous abdomen and whole of legs, are pale testaceous, the posterior tibiae and tarsi whitish with apices only of hind tibiae castaneous, and the recurrent nervure emitted somewhat distinctly before centre of areolet. They are certainly referable to *M. basalis*, Curt., which seems to differ from the present species in nothing but perhaps having the antennae shorter and paler, and hind coxae externally subinfusate; it was described from the New Forest, where it was found on tree stumps

in shady groves early in June. Stenton bred a pair from *Abraaxas grossulariata* at Heine Hill in 1907, Lyle from an unknown host in the New Forest, Capron took it at Shere; and it is probably a common garden insect, since Tuck caught it in Bury St. Edmunds during June, 1902, and I have several times met with it at Monk Soham House, in spiders' webs early in September, 1908, and towards the end of August, 1911, it flew in at 8.30 p.m. to artificial light.

4. *temporalis*, Thoms.

Mesochorus temporalis, Thoms. Ann. Soc. Ent. France, 1885, p. 336, ♂ ♀.

Black with two mesonotal vittae, the temporal orbits and the legs red; petiolar area hardly extending beyond apical third of metathorax. Head with the facial and frontal orbits equally broadly white throughout, and cheeks somewhat broadly whitish. Antennae elongate, slender and nearly filiform. Thorax short and coarctate, with two red mesonotal vittae; areola emitting costulae nearly from its centre. Scutellum black. Abdomen black with the second to seventh segments apically very narrowly pale; petiole not slender and hardly longer than the stout terebra. Legs stout and red with the hind ones not black-marked; claws small and submutic. Wings hyaline, with stigma infusate-margined stramineous. Length, 5 mm.

Very like *M. orbitalis*. Holmgr., but with mesonotal vittae, shorter petiolar area, the terebra longer, hind legs immaculate with their tarsal claws neither coarsely nor elongately pectinate.

"Patria, Anglia" (Thoms. *l.c.*). Bred in Devon from *Zygaena filipendulae* in 1878 (Bignell), and named by Thomson (Trans. Ent. Soc. 1886, p. 354).

5. *fulgurans*, Curt.

Mesochorus fulgurans, Curt. Brit. Ent. x, 1833, 464; Hal. Ann. Nat. Hist. 1839, p. 114; Holmgr. Sv. Ak. Handl. 1858, p. 127; Thoms. Ann. Soc. Fr. 1885, p. 336, ♂ ♀. *M. laricis*, Htg. Jahresb. 1838, p. 273, ♀; Ratz. Ichn. d. Forst. i. 149; iii. 118, ♂ ♀.

An entirely fulvous species with the legs concolorous and frontal orbits not broadly paler; face quadrate and the lower mandibular tooth the longer. Length, 8–10 mm.

At once known from the other entirely fulvescent species by the very short central and lateral petiolar areae, the stramineous alar stigma, its large areolet emitting recurrent nervure obviously before the centre, and the nearly mutic claws extending beyond the pulvilli.

It is said to be one of the commonest species of the genus throughout Europe, usually found in shady places and originally in shady ravines in Ireland; Lapland, Vienna, Belgium from July to September, etc.; and bred from both *Casinaria vidua* and various *Lophyri* in France; Ratzeburg raised it from *L. laricis*, *L. variegatus* and *L. pini*; it is also recorded from *Eupithecia pimpinellata* in Prussia. Doubtless common with us; Haliday took it at Holywood in August and September; Bignell writes from Devon in August, 1880, "I have bred several *Casinaria vidua* this season from *Abraaxas grossulariata*, and two *Mesochorus fulgurans*, Hal. This is a hyperparasitic species, and I do not think there can be the slightest

doubt but that it was a parasite of *C. vidua*. I have arrived at this conclusion from the fact that they came out of *C. vidua* pupae, and thereby showing that *M. fulgurans* did not complete the entire destruction of *C. vidua* until it had spun its cocoon" (Entom. xiii, p. 246). Whatcombe near Blandford, September, 1891 (Richardson); Pitlochry, early in September, 1892 (Beaumont); bred at Herne Hill on 4th June, 1907, from *A. grossulariata* (Stenton); from a cocoon of *C. vidua* in Surrey, during 1910 (Tonge), and from the same species of cocoon, attached to the larva skin of *A. grossulariata*, at Felden in Herts (Piffard). Mr. W. Evans took a female at the lighthouse lantern at night during September, 1907, on the Isle of May in Firth of Forth.

6. *pectinipes*, Bridg.

Mesochorus pectinipes, Bridg. Trans. Ent. Soc. 1883, p. 166, ♂. (?) *M. pectinipes*, Thoms. Ann. Soc. Ent. Fr. 1885, p. 336, ♂ ♀; *M. Suecicus*, Schm. Opusc. Ichn. 1977.

A fulvous species with the legs concolorous and frontal orbits not broadly white; face transverse and the mandibular teeth of equal length (Thoms.). Head posteriorly subbuccate with mouth, face, cheeks and all orbits pale; face coarsely punctate, centrally longitudinally carinate, transverse and a little broader apically; mandibular teeth of equal length; clypeus distinctly discreted, smooth with few punctures and apically rounded. Antennae longer than body and basally ferrugineous, with basal flagellar joint a little longer than the two following. Thorax longer than high; mesonotum sparsely and regularly punctate, with distinct notauli; pronotal margin ferrugineous; areae of metathorax distinct; areola elongate and hexagonal; petiolar area complete. Scutellum apically acuminate. Abdomen longer and slightly narrower than head and thorax with the second segment apically, third discally and a basal mark on the fourth, ferrugineous; spiracles of basal segment just beyond its centre, and its sides thence immarginate and subconcave to the subaciculate apex; second segment distinctly and the third slightly longer than broad, remainder transverse. Legs rufescent testaceous, with hind coxae black; hind tibiae hardly infusate at both extremities; onyches and onychii dark; tarsal claws closely and elongately pectinate to extreme apex. Wings with stigma infusate and basally pale, radices stramineous; basal nervure continuous, areolet emitting recurrent from its basal third. (Bridg.). Length, 6–10 mm.

Thomson's *M. pectinipes* is little more than a split from *M. fulgurans*, differing in its shorter face, rather longer petiolar area, large areolet and in the elongately and very stoutly pectinate claws, which character is less obvious in the male. It is mainly on account of this stout unguis conformation that I venture to retain the descriptions of both Bridgman and Thomson here. We know that ALL his British examples of this genus were sent by the former to the Sage of Lund (cf. Tr. Ent. Soc. 1886, p. 354); and with Bridgman's *M. pectinipes* before him, it is extremely improbable he would erect a new species of the same name. At least both forms are British.

The English type was captured at Earlham near Norwich during May (Bridg. Trans. Norf. Soc. 1894, p. 622) and the Swedish was there bred from *Abraxas grossulariata*, from which Lyle has also raised it, hyper-

parasitically through *Casinaria vidua*, in the New Forest. I possess a couple of females of Thomson's form, bred by Clutten at Barnsley on 16th June, 1900, from a cocoon of *Melcorus albiditarsus*, Curt.—which it strongly resembles except in neuration—and another, captured on 3rd September, 1910, at Torphins by Elliott.

7. *vitticollis*, Holmgr.

Mesochorus splendidulus, var. 7, Gr. I.E. ii. 965, ♀. *M. vitticollis*, Holmgr. Sv. Ak. Handl. 1858, p. 128; Brisch. Schr. Nat. Ges. Danz. 1880, p. 181; Thoms. Ann. Soc. Fr. 1885, p. 337, ♂ ♀.

A black species; face with orbits, part of thorax and the legs pale; base and apex of hind tibiae black-marked; face somewhat strongly, and mesopleurae closely, punctate. Head testaceous with a central frontal vitta, coalescent with a large occipital mark, black; vertex not narrow, cheeks subbuccate and not very short; mandibles stout and elongate, not apically constricted, with the lower tooth the longer; face quadrate. Antennae pale, elongate and subtestaceous. Thorax rarely entirely black, usually with two mesonotal vittae and mesosternal lines pale; areola narrow and elongate, petiolar area centrally and at sides short and subparallel-sided. Scutellum pale, rarely black. Abdomen black with second segment triangularly flavidous and the remainder in ♀ always, in ♂ sometimes, pale; petiole narrow, with spiracles of basal segment central; terebra not subulate, shorter than first segment. Legs pale flavous, with apices of hind coxae occasionally nigrescent; hind tibiae with their apical margin subsetulose, apices dilato-reflexed, and at extreme base and apex black; hind tarsi very slightly infusate-testaceous towards their apices; claws submutic and longer than pulvilli. Wings hyaline, with stigma always testaceous; parallel nervure emitted a little above centre of brachial cell; nervellus suboblique and postfurcal; basal nervure continuous and areolet not sessile. Length, 7–10 mm.

Brischke says the ♂ sometimes has the thorax red with only the mesosternum and metanotum black, at others with the mesopleurae rufescent-flavous.

This species is common and is found over the whole of Europe; it occurs throughout Sweden, and is found in Belgium from July to September; in Prussia it has been raised from *Campoplex* cocoons in larvae of *Fidonia cembraria* and from a *Microgaster* in larvae of *Cucullia argentea*. By no means abundant in Britain, as far as is at present known; Wroxham and Eaton near Norwich in June; bred by Bignell from *Xylina rhizolitia* and by W. Fletcher from *Chrysocoris festaliella* (Bridg. Norf. Trans. 1894 et Entom. 1884, p. 71); King's Lynn (in coll. Atmore); a full series from Shere in Surrey (Capron); Devonshire (de la Garde); on bank of the Tay at Birnam in Perth, by sweeping in August, 1907 (Elliott). I have swept it at dusk early in June, 1900, at Bungay, and beaten it from birch in Tuddenham Fen in the middle of August, in Suffolk; taken it in the middle of June on the bank of the Nene near Peterborough in 1908, in woods near Market Rasen in Lincs in 1912, and in the middle of August, 1901, a female turned up at Lyndhurst in the New Forest.

8. *testaceus*, Grav.

Mesochorus testaceus, Gr. I.E. ii. 973, ♂; Holmgr. Sv. Ak. Handl. 1858, p. 128; Thoms. Ann. Soc. Fr. 1885, p. 337, ♂ ♀; (?) Fonsc. *lib. cit.* 1852, p. 439, ♀ et Brisch. Schr. Nat. Ges. Danz. 1880, p. 181, ♂ ♀.

A pale testaceous species with sparse black markings, the pleurae smooth and face finely punctate. Head with face finely punctate and in ♂ usually substramineous; ocellar region sometimes nigrescent. Thorax laterally smooth and usually broadly flavous-marked. Scutellum flavidous. Abdomen with first segment ferrugineous or piceous, basally paler, the second piceous with its apex and usually centre testaceous; the following segments pale, rarely laterally subinfusate. Legs pale flavous, with hind tibiae and tarsal joints usually apically infusate. Wings hyaline with stigma either testaceous or piceous, and tegulae whitish. Length, 7-9 mm.

Similar in size, central petiolar spiracles, continuous basal nervure, subpetiolate areolet, quadrate face, longer lower mandibular tooth, basally black abdomen with triangularly flavidous second segment, the structure of the claws and not subulate terebra to *M. vitticollis*; though distinct therefrom in its darker stigma, basally testaceous petiole, laterally submarginated postpetiole and not black-marked hind tibiae. Very like *M. fulgurans* in colour but more flavidous and slender with two basal segments always partly badius, stigma often darker and the recurrent nervure emitted from centre of areolet.

Not common in north and central Europe; found during June in Belgium; and bred in France from *Tachina flavescens* (Giraud, 1877), from *Clavellaria amerinae*, *Dinura stilata*, *Pocilosoma candidata*, and *Tachina larvarum* (Gaulle); *Eupithecia pimpinellata* is also instanced as host by Brischke in Prussia. A good deal scarcer with us than the last species and apparently confined to Tenthredinid hosts: Brundall near Norwich in May (Bridg.), Kings Lynn in Norfolk (Atmore), two at Shere in Surrey (Capron), Banchory in Kincardine during September, 1910 (Elliott, misnamed *M. vitticollis* by me, E.M.M. 1911, p. 93). Nearly all my examples consist of two batches; one comprising a dozen of both sexes is from the New Forest (Miss Chawner), the other comprising about a score of males only, emerged on 14th May, 1901, through four distinct holes in a *Cimbex* cocoon "formed by a large white sawfly larva, with a dark medio-dorsal stripe, beaten from birch at Paul's Cray Common near Chislehurst on 22nd September, 1900" (Montgomery); doubtless this host was *C. femoralis*, L.=*sylvarum*, Cam. It has only occurred to me towards the end of August, 1905, also by beating birch, at Tuddenham Fen in Suffolk.

9. *semirufus*, Holmgr.

Mesochorus semirufus, Holmgr. Sv. Ak. Handl. 1858, p. 125; Brisch. Schr. Nat. Ges. Danz. 1880, p. 180; Thoms. Ann. Soc. Fr. 1885, p. 337, ♂ ♀.

A pale species, with the thorax and abdominal base black; pleurae punctate. Head narrow behind the eyes; face transverse and except apically rufescent, with the mouth, cheeks, frontal shortly and other orbits, stramineous; mandibular teeth of equal length. Antennae pale, finely pilose and as long as body. Thorax stout, finely punctate and somewhat

coarctate, with complete upper areae; thorax margined with, or mainly, red; petiolar area short with its centre a little longer than sides. Scutellum always black. Abdomen smooth, longer than head and thorax; basal segment slightly curved, centrally elevated; petiole not narrow, basally dark ferrugineous, with a small sulcus before the spiracles; second segment apically rufescent and the remainder fulvidous-flavous, of ♂ somewhat variable in colour; ♀ with second and third segments subquadrate; terebra shorter than basal segment, black and apically pale. Legs flavous with the hind tibiae basally, and more broadly apically, nigrescent; hind tarsi not dark; claws submutic and extending beyond pulvilli. Wings hyaline, with stigma nigrescent and tegulae whitish; basal nervure continuous and areolet large, emitting recurrent nervure a little before its centre; parallel nervure emitted a little above centre of brachial cell. Length, 8–9 mm.

Schmiedeknecht says it is distinguished from its immediate allies by the robust form, entirely black thorax and inpectinate claws.

He has often taken it in Thuringia, it was described from Sweden and Brischke bred it from *Cucullia argentea* through *Microgaster* species, from *Dasychira selenitica* through *Rhogas* species, and from larvae of *Hyponomeuta malinella*. I have not recognised it among my British examples of this genus; though Bignell twice met with it in Devon: bred at the end of June from *Hybernia progemmaria* through *Limnoria crucator*; and "captured piercing *Eupithecia castigata* that had within it *Agrypon claudes-tinum*, which I bred 10th September" (Devon List of Entom. 1881, p. 141).

10. *confusus*, Holmgr.

Mesochorus splendidulus, Ratz. Ichn. d. Forst. i. 148 (partim, nec Grav.); Holmgr. Sv. Ak. Handl. 1854, p. 59. *M. confusus*, Holmgr. lib. cit. 1858, p. 129, ♂ ♀.

A nitidulous, punctulate and black species, with very variable markings. Head with the mouth, clypeus, face, internal and external orbits broadly, flavidous or fulvidous; mandibular teeth of equal length. Antennae infusate and paler beneath. Thorax at least partly red. Abdomen red or fulvescent-stramineous with the first segment entirely, the second nearly to its apex and usually sides of the following more or less, black. Legs fulvescent with stramineous markings, the hind tibiae black at their base and apex above. Wings subhyaline with stigma infusate or dull testaceous. Length, 4–6 mm.

At first sight this species is said by its author to strongly resemble *M. vitticollis*, though recognised by the equally long mandibular teeth and the infusate or dull testaceous stigma, which is not uncommonly stramineous; from *M. vittator* it differs in the unequal structure, the claws here being indistinctly pectinate while in that species the pectination is elongate to their centre. The basal segment, too, is much straighter and less elevated than in its allies. Schmiedeknecht considers *M. gracilentus*, Brisch. (Schr. Nat. Ges. Danz. 1880, p. 188, ♂), a variety of this species with the abdomen black and only apices of the second and third segments testaceous; three other of Brischke's species he also sinks as forms of the present, along with *M. cimbricis*, Ratz. (Ichn. d. Forst.), as was done by Marshall in 1872.

Probably more than one kind has, at various times, been included under this name and the Continental breedings from such diverse insects

as *Cimbex*, *Cladius difformis*, *Microplitis fumipennis*, *Eupithecia pimpinellata*, species of *Hyponomeuta*, *Clavillaria*, *Neurotoma*, *Larentia*, and from *Meteorus pulchricornis* (Marsh. Brit. Bracon. ii. 115) cannot all be reliable. Its range is said to extend throughout Europe; it is frequent all over Sweden and occurs in both Holland and Belgium during July and August. Our own recorded hosts of this hyperparasite are hardly more homogeneous than the above. It was found by Walker in the Isle of Man (Entom. 1872, p. 432); both sexes bred from larvae of *Cidaria sagittata* (Proc. S. Lond. Soc. 1896, p. 80); taken by Wilson near York in the act of ovipositing in a larva of *Nematus ribesii* in 1880 (Yorks. Nat. 1881, p. 153; *teste* Bridg.); a common species in Norfolk (Bridg.); bred by W. Fletcher from *Lycæna alsus* (Entom. 1884, p. 71); bred in Devon on 7th September from *Microplitis* through *Xylopora Fabriciana* (Entom. 1883, p. 67); the var. *gracilentus* was reared (*loc.* 1881, p. 141) on 13th July from *Lamneria vulgaris* through *Gompheryx rhamni* by Bignell (Devon List).

This is not an uncommon species in Britain, though I have rarely met with it personally; I possess examples from Botusfleming in Cornwall, Cornworthy (Marshall) and Lydford in September, 1891 (de la Garde) in Devon; the New Forest (Adams); Giffnock at the end of May, Crookston and Gourock in June, 1899 (Dalglish); two males with dark and pale stigma were bred together at Rannoch on 7th July, 1905, from *Oporabia dilutata* (Cockayne); and another was raised on 8th October, 1900, from—doubtless some *Rhogas* in—the indurated skin of some Geometrid larva found attached to a leaf “on grass near the Falls of the Shin, Inveran, Sutherlandshire” (Col. Yerbury), whence it had emerged through a large orifice below the anus. In Suffolk I have taken this species by sweeping at Brandon staunch in June, Henstead marsh in September, Foxhall in May, on a house window in Ipswich in July, and Platten has there bred it on the 7th of the same month from *Hyponomeuta padella*. Lyle has bred it hyperparasitically from *Cheimatobia brumata* through *Phobocampa crassiuscula*, in the New Forest.

11. *fuscicornis*, *Brisch.*

Mesochorus fuscicornis, Brisch. Schr. Nat. Ges. Danz. 1880, p. 185, ♂ ♀; Schm. Opusc. Ichn. 1981.

Head little constricted posteriorly with palpi, mandibles except apically, genal apices and the clypeus flavous; head of ♀ black with the orbits narrowly rufescent, of ♂ red with the face flavous and both frons and occiput black. Antennae as long as body, piceous with the two basal joints red. Thorax black, with the ♂ prothorax and part of mesopleurae red; mesonotum apically elevated; metathorax rounded, with complete upper areae. Abdomen black, with apex of second and base of third segments testaceous; second segment as long as apically broad; terebra somewhat slender and shorter than basal segment. Legs testaceous, with base and apex of hind tibiae nigrescent; hind coxae of ♀ entirely black and of ♂ only infuscate-dotted above. Stigma infuscate and in ♂ slightly paler; tegulae whitish; radius apically distinctly reflexed, areolet emitting recurrent nervure almost from its centre. Length, 3–4 mm.

It was described from Prussia, but Schm. has not met with it in Thuringia; and all subsequent mention of the species seems to be from Britain. “I have bred both sexes of a *Mesochorus* from the cocoons of a

Microgaster, which agrees exactly with Brischke's description of the above" (Bridg. Trans. Ent. Soc. 1882, p. 154; *cf. l.c.* 1886, p. 354). Bred in Devon on 6th June from *Abraxa grossulariata* through *Apanteles nothus*, and on 28th September from *Melanippe gularia* through the same Braconid (Bignell; quoted by Marshall, Bracon. d'Europ. i. 437). Hyperparasitic through *A. grossulariata* on *Exorista vulgaris* (Buckler, vii.). Doubtless very common in Britain; I have a dozen in Capron's Surrey collection and two from Bignell "hyperparasitic on *Scythropia crataegella*" in Devon; a ♀ bred by Slater in November, 1908, from a Braconid cocoon ex *Eupithucia ? coronata*; and I have met with it in June at Diss in Norfolk, Marvell Cope in the Isle of Wight and Brandon in Suffolk.

12. *crassicus*, Thoms.

Mesochorus olerum, Curt. Brit. Ent. x. 1833, 464; *cf.* Hal. Ann. Nat. Hist. 1839, p. 114, ♀ (?). *M. crassicus*, Thoms. Ann. Soc. Ent. France, 1885, p. 339, ♂ ♀.

Black with the abdomen centrally, the orbits and legs, rufescent; stigma infuscate and front tibiae of ♀ subclavate. Head with ocelli somewhat small, the orbits rufescent, cheeks almost longer than mandibular base, and the ♀ face black. Antennae somewhat stout and a little pilose towards their base. Thorax black. Abdomen not strongly compressed apically; apex of second segment and nearly whole of the third red, the remainder black with their apices very narrowly pale; terebra short. Legs with base of hind tibiae, and their apices more broadly, nigrescent; hind tarsi pale, unguiculi not narrow. Wings slightly infumate, with parallel nervure emitted a little above centre of brachial cell. Length, 6-7 mm.

Thomson omits the locality of his species and it is very probable that the type was among the examples he named, bred by Fletcher in June from Wicken Fen out of *Galechia notatella* (Trans. Ent. Soc. 1886, p. 353). It is perhaps not uncommon with us, since Capron had a full series from Shere, Stenton has given me males bred from *Abraxa grossulariata* in May, 1907, at Herne Hill near London, and Lyle has raised it hyperparasitically from *Thera variata* through a black species of *Anilasta* in the New Forest.

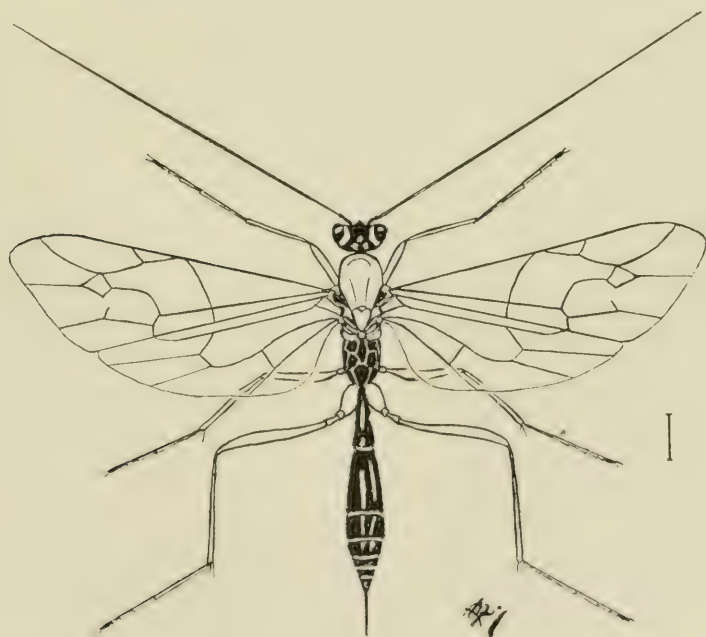
Bridgman appears to have made up his mind as to what species the Curtisian descriptions, insufficient though they be, represented, for he named Bignell's specimens with several of them. The Curtis collection is in Australia and, in the absence of types, I am less fortunate (or bold). Thus I can but surmise that it be not impossible that *M. olerum* which, according to Haliday, "may prove to be a variety of *M. splendidulus*," Grav., is a form of the present species. On 30th May in a garden at Laira in Devon, Bignell saw a female of *M. olerum* flitting about from leaf to leaf, with antennae in constant motion, evidently hunting for a victim. After a time she found a caterpillar of *Abraxa grossulariata* and, first passing round it several times, "she suddenly sprang on the unfortunate larva, and thrust her ovipositor into the second segment just below the dorsal line; the larva, during the operation, twisted itself from side to side to get rid of the foe." The Ichneumon next alighted on a leaf, very carefully wiped her terebra, and was boxed. The larva pupated on 14th June and *Casimaria vidua* emerged from it on 29th. "No doubt *M. olerum*, who is a hyperparasite, having found that the *A. grossulariata* was infested

with the larva of a *Casinaria*, tried to deposit her egg in the latter larva, but by some mishap it did not reach the intended destination" (Bignell, Entom. 1880, p. 245). A female is recorded with some hesitation by Fitch from *Gracillaria phasianipenella* (l.c. 1881, p. 141); and as bred by Raynor with no query from a species of *Coleophora* feeding on *Galium verum* (l.c. 1883, p. 67).

13. *thoracicus*, Grav.

Mesochorus thoracicus, Gr. I.E. ii. 971; Ratz. Ichn. d. Forst. iii. 120; Holmgr. Sv. Ak. Handl. 1858, p. 117; Thoms. Ann. Soc. Fr. 1885, p. 339, ♂ ♀; Fonsc. lib. cit. 1852, p. 437, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 180, ♂; cf. Stein, Ent. Nachr. 1885, p. 308.

Black with the thorax discally sanguineous, pleurae punctate, internal orbits entirely whitish, and the claws coarsely and shortly pectinate to their apices. Head transverse and hardly constricted posteriorly; of ♀ black with a quadrate central facial mark flavous-margined, of ♂ fulvous with the frons, occiput and temples nigrescent, face mainly pale; orbits



of both sexes broadly rufescent; face subdeplanate and mandibles broad with teeth of equal length. Antennae piceous, basally paler beneath. Thorax stout, nitidulous, finely and diffusely punctate, and red with mesonotum sometimes apically dark-marked and the discally nigrescent metathorax with complete upper areae, the areola narrow and petiolar area short; prothorax of ♂ flavidous-marked. Scutellum red. Abdomen hardly longer than head and thorax; black with only apices of all the

segments narrowly, and more distinctly in ♀, whitish; ventral plica flavidous and the hypopygium pale-margined black; basal segment convex, with postpetiole feebly aciculate; second and third segments transverse in ♀ and quadrate in ♂, with the latter rarely basally rufescent; terebra slightly shorter than basal segment. Legs rufescent flavous, with hind tibiae at extreme apices and the onychii dark; claws densely and elongately pectinate to beyond their centre. Wings hyaline with stigma flavidous, tegulae whitish and areolet large, emitting recurrent nervure slightly before its centre. Length, 6–8 mm.

I still regard the ♀ bred from Leeds *Exetastes cinctipes* cocoon and referred to by me at Ichn. Brit. iii. 294, to represent a form of the present species, though distinct and atypical in its entirely testaceous third segment, rather broader temples, proportionately longer abdomen and great size—9 mm. *M. thoracicus* differs from *M. crassicus* and *M. sylvarum* in having the head a little constricted behind the eyes, the antennae slender and nigrescent, the areolet large and emitting recurrent before its centre, the lower angle of discoidal cell subacute, the legs rufescent testaceous with the hind tibiae apically black and their tarsi dull ferrugineous.

It is one of the commonest species in north and central Europe; the original males were taken on a heath in Germany during October; it is found in Holland in March, May and August and in Belgium from July to September. It has been bred from a species of *Tachina* through *Zygæna onobrychis* in Austria (Giraud, 1877), from *Agelastica alni* (Dalla Torre, Cat.), by Tischbein from larvae of *Goleruca lineola* in Germany, (Ratz. l.c.) and Kawall says (Stett. Ent. Zeit. 1861, p. 125) that he raised the female in Kurland from *Chrysomela varians*. Doubtless common with us, though rarely taken on the wing. Isle of Man (Walker, Entom. 1872, p. 432); Weston Mills in Devon during the middle of May (Bignell); half-a-dozen at Shere in 1879 (Capron, Entom. 1880, p. 89); Ivybridge in Devon, 1890 (S. Edwards); three females bred with a female Braconid from larvae of *Peronea maccana*, Tr. (Proc. S. Lond. Soc. 1896, p. 81); bred from larva of *Fidonia piniaria* through a *Campoplegid* cocoon on 20th April, 1904, in the New Forest by Lyle, who believes this to be the species he has bred seven or eight times at Brockenhurst through a *Limnerium* from *Thera variata*. I swept two males in the Reydon marshes in early June, 1905, and another at the Westleton lamb pits, with a third taken on the wing in marshes near Kessingland during September, 1912, all near Southwold in Suffolk.

14. *sylvarum*, Curt.

Mesochorus sylvarum, Curt. Brit. Ent. x, 1833, 464; Hal. Ann. Nat. Hist. 1839, p. 114, ♀; Holmgr. Sv. Ak. Handl. 1858, p. 124; Thoms. Ann. Soc. Fr. 1885, p. 339, ♂ ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 180, ♂.

A black species with the mesothorax nearly always mainly or entirely red, the legs flavidous-stramineous, terebra very short and stout, and anal styls of ♂ subulate. Length, 5–9 mm.

Superficially this species is recognisable by the short and stout terebra, and, as Haliday remarks, approaching *Astiphrommus alarius* and *A. attricillus* in its narrow and attenuate form, and strongly compressed abdomen. It is known from all other species of the present genus by the parallel-sided face and cheeks, the internal orbits and conspicuous mark

on the frons above the scrobes white; the hind tibiae basally and above at their apices black, the hind tarsi pale, and apices of the transverse second and of the following segments narrowly whitish, as in the last species, which it resembles in structural details.

Usually not uncommon in north and central Europe, occurring in grassy places throughout Sweden from early June to August; it is recorded from Holland in June and Belgium in August; Gaulle tells us it has been raised from *Alucita galactodactyla* in France. A common species in Norfolk during July and August, bred from *Peronea maccana* (Bridg.); and in Devon from *Vanessa atalanta* through *Microgaster sub-completus* (Bignell, List et Entom. 1882, p. 141). It is certainly uncommon in Suffolk, where I have only found it in Tuddenham Fen in June, 1910, and on flowers of *Heracleum sphondylium* at Hadleigh at the end of July, 1902; I possess half-a-dozen from Shere (Capron), females from Painswick in Gloucestershire (Watkins) and on *Myrica gale* at Matley Bog in the New Forest early in July, 1909. Francis Walker first took it in England and Haliday found it in woods from June to August, both in Ireland and the Hebrides. Lyle has bred it hyperparasitically from *Tortrix ribeana* through *Phytodietus polyzonias* in the New Forest.

15. *dimidiatus*, Holmgr.

Mesochorus dimidiatus, Holmgr. Sv. Ak. Handl. 1858, p. 118, ♂; Brisch. Schr. Nat. Ges. Danz. 1880, p. 180; Thoms. Ann. Soc. Ent. France, 1885, p. 340, ♂ ♀.

A pale flavous species with the thorax discally, abdomen basally, stigma and a basal hind tibial dot, black. Head transverse and testaceous with a broad frontal vitta, mandibular teeth and a transverse occipital mark black; cheeks elongate and buccate; face broader than long and mandibles somewhat stout with teeth of equal length. Antennae slender, infusate and as long as body. Thorax coarctate and little longer than high, finely and diffusely punctate; testaceous or in ♂ paler, and discally black, rarely rufescent-marked; upper metanotal areae complete, with areola somewhat broad. Abdomen hardly longer than head and thorax, testaceous with first segment basally ferrugineous, the second and base of third black and in ♀ subquadrate, in ♂ subelongate; terebra short and flavous. Legs testaceous, with trochanters paler; hind tarsi stout and the claws obviously pectinate; hind tibiae nigrescent only at extreme base. Wings hyaline with radial nervure apically straight, basal nervure continuous, stigma piceous, tegulae whitish and areolet of normal size, emitting recurrent nervure from its centre. Length, 7-9 mm.

This and the four following species form a small group having the face of both sexes pale and the anus, at least in ♀, testaceous and never entirely black.

Not a common species in northern and central Europe; it was described from south Lapland in August and is found in Holland in July, in Belgium during April and June, as well as in France; though nowhere yet bred. It has not hitherto been recognised as British, but I possess a single beautiful pair in Dr. Capron's collection from the vicinity of Shere in Surrey, doubtless constituting part of the thirteen species of this genus said by him (Entom. 1880, p. 89) to have been there captured during 1879; and I have seen a female discovered in June, 1902, by Atmore about King's Lynn in Norfolk.

16. *crassimanus*, Holmgr.

Mesochorus crassimanus, Holmgr. Sv. Ak. Handl. 1858, p. 125, ♀; Thoms. Ann. Soc. Ent. France, 1885, p. 340, ♂ ♀.

Black with the abdomen towards its apex, and the legs, flavous; hind tibiae with a basal mark, and their apices more broadly, nigrescent; onychii dilated. Head distinctly constricted posteriorly, black with mandibles except apically, palpi and apices of cheeks, flavous; face, outer orbits and sides of frons fulvidous. Antennae somewhat shorter than body, piceous, becoming rufescent beneath. Thorax black with prothoracic margin and pleural sutures usually rufescent; pleurae centrally glabrous and nitidulous. Scutellum black, of ♀ very rarely red. Abdomen a little longer than head and thorax, testaceous with the slightly curved basal segment entirely, the longer than broad second except at apex, black; third segment quadrate and usually laterally nigrescent; terebra a little shorter than basal segment. Legs testaceous, with anterior coxae and trochanters whitish; hind coxae and femora rufescent, and tibiae pale flavous with both extremities nigrescent; onychii, especially the front ones, explanate; claws distinctly pectinate to centre. Wings slightly infumate, with stigma piceous and tegulae whitish; areolet somewhat large, emitting recurrent nervure from its centre; basal nervure continuous. Length, 6–8 mm.

This differs from *M. dimidiatus* in its strongly elongate body, testaceous stigma, black and longer terebra, shorter and not buccate cheeks, and in the apically constricted mandibles. It is very like *M. semirufus* but besides the peculiarly incrassate onychii, it is distinguishable by its smaller size and entirely pale face.

Northern Europe; said by Brischke (Schr. Nat. Ges. Danz. 1880, p. 208) to have been bred in Prussia from *Hyphena rostralis*. It has long been known as British but the only record discoverable is Bridgman's (Trans. Norf. Nat. Soc. 1894, p. 623) from Eaton near Norwich in August. Lyle has bred it in the New Forest hyperparasitically from *Chimantobia brumata* through *Melcorus pulchricornis*, Wesm. I possess three females from the neighbourhood of Shere in Surrey in Capron's collection and another bred by Rev. T. A. Marshall from *Hyponomeuta padella* at Botusfleming in Cornwall. Roman tells us (Ent. Tidskr. 1912, p. 67) that it has also been bred from the last host in South Finland and synonymises it with *Mesochorus dimidiatus*, Holmgr.; in that case I think Thomson's *M. dimidiatus* must be distinct.

17. *vittator*, Holmgr.

Tryphon vittator, Zett. I.L. i, 1838, 387, ♀. *Mesochorus vittator*, Holmgr. Sv. Ak. Handl. 1858, p. 126; Thoms. Ann. Soc. Fr. 1885, p. 340, ♂ ♀. *M. brunneus*, Brisch. Schr. Nat. Ges. Danz. 1880, p. 184, ♂.

A red species with black markings, hind tibiae basally marked with and apically more broadly nigrescent, and the onychii not dilated. Head testaceous with mandibles except apically, palpi and genal apices flavous; centre of frons, vertex and occiput black; cheeks not very short. Antennae as long as, or in ♂ rather longer than, the body; ferrugineous, becoming basally flavidous beneath. Thorax very rarely entirely black, usually with prothorax rufescent; mesonotum red with three black vittae or black with two red ones; pleurae and sternum usually mainly red;

metathorax discally smooth, with complete areae and centre of petiolar area little longer than its sides. Scutellum wholly or partly red. Abdomen testaceous with two basal segments, except apex of second, black; third, and sometimes the following segments, laterally infusate, anus often infusate, especially in ♂; terebra somewhat shorter than the little curved basal segment. Legs testaceous with anterior coxae and trochanters, and hind tibiae except their nigrescent extremities, flavidous; tarsal joints apically infusate; claws pectinate almost to their centre. Wings slightly infumate, with stigma entirely or inferiorly nigrescent; tegulae whitish. Length, 6-7 mm.

Common in Sweden in July and August, and there bred from *Tinea evonymella*; Holland and Belgium in August and September; bred in France from *Simaethis Fabriciana*. Dr. Chapman has given me this species, bred by him through *Rhogas gasterator* from *Orgyia splendida* in Spain during August, 1903. A common species in Norfolk and bred at Kings Lynn by Atmore from *Nola cucullatella* (Bridgman); bred in the middle of July from *Hyponomeuta evonymella* through *Limmeria chrysosticta* in Devon (Bignell); a full series from Shere (Capron); Bristol (Charbonnier); Cornworthy in Devon (Marshall); Greenings in Surrey, May, 1872 (Saunders); bred from Southport *Eupithecia absynthiata* early in June, 1907, through *Campoplegid* cocoons (Clutton); and from apparently the same species of cocoons from *E. oblongata* on *Angelica sylvestris* at Doncaster in 1901 (Cassal). I have captured it at Ryde in the Isle of Wight in mid-August, and by sweeping in Barnby Broad in Suffolk in mid-May and at the end of August, 1898.

18. *tenuiscapus*, Thoms.

Mesochorus tenuiscapus, Thoms. Ann. Soc. Ent. France, 1885, p. 341, ♂ ♀.

A black species with the legs pale, the abdominal petiole nearly linear and ♂ anal styli subulate. Length, 7 mm.

This insect is known in the present group by its longer and basally dark testaceous petiole, the pale stigma, the pronotum with both mesonotal and pleural marks and the scutellum pale, and the less broadly dark-marked hind tibiae. In the case of almost any other author this description, all vouchsafed us by Thomson, would appear ridiculously inadequate, but he had so skilled a knack of presenting pertinent features and adding to them just those points which distinguish it from allied kinds that I have no doubt the above meagre details will suffice to render the present species sufficiently distinct.

It was described from Sweden and no one has found it elsewhere, except Bridgman, who queries (Trans. Norf. Nat. Soc. 1894, p. 623) his capture of this species in May at Brundall near Norwich.

19. *pallidus*, Brisch.

Mesochorus pallidus, Brisch. Schr. Nat. Ges. Danz. 1880, p. 184, ♂ ♀. *M. stigmaticus*, Thoms. Ann. Soc. Ent. France, 1885, p. 341, ♂ ♀ (*nec* Brisch.).

An infusate species, with testaceous markings; the legs stout and white, the hind tibiae apically and stigma broadly black, with base of latter pale testaceous. Head broader than thorax and posteriorly constricted, whitish with mandibular teeth, occiput and ocellar region black;

♀ face pale; cheeks short. Antennae as long as body, rufescent and in ♂ apically infusate. Thorax of ♀ piceous or nigrescent, mesonotum rufescent with three dark vittae, of ♂ testaceous with three mesonotal vittae and part of metanotum piceous; metathorax with complete upper areae. Scutellum of ♀ rufescent. Abdomen piceous with first segment basally whitish, second with testaceous and in ♂ paler apical margin, third nearly entirely whitish flavous, as are the two following apically and anus nearly entirely; basal segment little curved, with petiole slender and postpetiole sulcate. Legs somewhat stout and whitish flavous, with ♀ femora subrufescent; hind coxae sometimes dark-marked, with their tibiae apically and all the claws nigrescent. Stigma large and black with base and apex whitish, tegulae pale flavous; radial nervure apically nearly straight; areolet emitting recurrent nervure a little before its centre; basal nervure continuous. Length, 5-7 mm.

This is similar to his Swedish *M. albipes*, says Thomson, but with the cheeks and calcaria shorter, the stigmal colour determinate and the mesonotum whitish testaceous with three infusate olivaceous marks; Schmiedeknecht adds that the scutellum shows traces of an apical granule.

North and central Europe; frequent in Thuringia, usually in shady places; and bred by Brischke from *Microgaster* species in *Cucullia argentea* and from *Microgaster* cocoons in larvae of *Smerinthus populi* and *Amphydasis betularia*, as well as from *Rhogas* species in larvae of *Porthesia auriflua* in Prussia. With us it was captured by Norgate at Earham and Sparham in Norfolk; bred by Cross—probably at Ely—from *Acronycta ligustri* (Bridg. Trans. Norf. Soc. 1894) and by Norgate from *Orgyia antiqua* (Trans. Ent. Soc. 1886, p. 353; ascribed in error by Schmiedeknecht to *M. stigmaticus*, Brisch., which is not yet known to be British).

20. *pectoralis*, Ratz.

Mesochorus pectoralis, Ratz. Ichn. d. Forst. i. 149, ii. 110; Holmgr. Sv. Ak. Handl. 1854, p. 59; *lib. cit.* 1858, p. 129; Brisch. Schr. Nat. Ges. Danz. 1880, p. 181; Thoms. Ann. Soc. Fr. 1885, p. 341, ♂ ♀.

Small and black, with the legs rufescent and the hind ones black-marked. Head with the ocelli not large, mandibles constricted towards their apices, cheeks compressed and not elongate, at least the inner orbits rufescent; face except sometimes above, mouth, clypeus and genal apices, flavidous. Antennae black, with the flagellum elongate, slender and filiform. Thorax somewhat coarctate and black with prothorax sometimes rufescent, and the pleurae and sternum rarely red-marked; petiolar area a little longer at centre than at sides. Abdomen compressed towards anus, black with disc of third segment and apical margin of the second rufescent; postpetiole usually sulcate and the two following segments subquadrate; terebra as long as basal segment. Legs somewhat deep red with the anterior basally whitish; hind coxae, apices of tibiae broadly and their base, with the slender tarsi, nigrescent; claws and pulvilli small. Wings hardly infumate, with stigma somewhat broad, nigrescent; tegulae whitish; areolet not large, emitting recurrent nervure from its centre; radius apically curved. Length, 5-6 mm.

This and *M. tachypus* differ from the five last-described in having the hind tarsi nigrescent or obscurely infusate, the thorax black and the ♀

face never entirely pale. It is somewhat similar in shape and colouration to the common *M. confusus*, but is much smaller with the radius much more apically curved. Some confusion appears to have existed between the present species and *M. fuscicornis*, Brisch. (cf. Trans. Ent. Soc. 1886, p. 354).

Originally bred from *Bombyx pini* in Prussia; common in Sweden; France; Belgium and Holland in July and August; Vienna; and bred in Prussia from both *Campoplex* and *Microgaster* species in larvae of *Cidaria galiaria*, *Eupithecia centaurearia*, *Fidonia cembraria*, *Cucullia argentea* and *Hyponomeuta*. In Britain, Piffard has found it at Felden in Herts; Bridgman records it from Earlham and Mousehold near Norwich, and bred from cocoons of both *Apanteles congestus* and *A. zygaenarum*; and Jordan (E.M.M. 1869, p. 138) raised it solitarily at Birmingham from *Pterophorus* (*Liopitilus*) *tephradactylus*, together with—doubtless through—*Rhogas bicolor*, Spin. In my experience it is an autumn species occurring on thistles in the Bentley woods as late as 16th November; I have also found it on water-plants in Gritnam Wood in the New Forest at the end of August, and in a Ryde greenhouse early in September. Dr. Chapman has given me a female, which emerged on August 5th, through an *Apanteles* cocoon, from a caterpillar of the rare Continental *Lycæna orbitulus*, found on July 1st; the cocoon was spun under the larva, "at least the *Lycæna* larva was sitting on the cocoon and remained there till its death, some ten days after it was found; the *Lycæna* was in its penultimate skin and had fed little, if at all, after hibernation."

21. *brevipetiolatus*, Ratz.

Mesochorus brevipetiolatus, Ratz. Ichn. d. Forst. i. 148; iii. 117; Brisch. Schr. Nat. Ges. Danz. 1880, p. 181, ♂ ♀.

An infusate piceous or badious species. Head short and broader than thorax, posteriorly constricted; palpi, mandibles except apically, genal apices and inner orbits flavidous; ♀ with outer orbits narrowly red and ♂ with whole face also flavidous. Antennae infusate and in ♂ basally paler beneath. Thorax with radical callosities pale flavous; of ♂ with prothorax and pleurae subrufescent. Abdomen with the second segment apically flavidous, and the third in ♀ basally rufescent and in ♂ apically testaceous throughout; petiole broad and less than half length of basal segment; postpetiole not margined, with one or three superficial sulci. Legs testaceous, with hind coxae and their femora red; apices and extreme base of hind tibiae, and their tarsi, infusate with base of latter pale. Stigma infusate piceous, basally pale; tegulae whitish; areolet not or shortly petiolate, emitting recurrent nervure at or before its centre; basal nervure continuous. Length, 4–6 mm.

Brischke says the mesonotum of both sexes is occasionally red with black markings, and that the ♂ sometimes has the hind coxae and their femora mainly black.

This is a central European species, first bred by Ratzeburg from *Noctua piniperda* in Prussia; subsequently, and also in Prussia, Brischke says "Aus *Campoplex*-Cocons von Raupen der *Eupithecia pimpinellaria*, *succenturiaria*, *innolata*, und aus *Microgaster*-Cocons von *Cucullia Verbasci*, *Eupithecia succenturiaria* und *digitaliaria*, *Pseudopterna cythisaria*, *Chesias spartiaria*, *Argynnis Latonia* und *Diloba cœrucocephala*, *Zygaena*, aus *Rogas*

in Raupen von *Dasychira selenitica* und aus Raupen von *Yponomeuta evonymella erzogan*." It is found in France; but there seem to be no British records since its inclusion in Marshall's 1872 Catalogue, and I have not met with it.

22. *tachypus*, Holmgr.

Mesochorus tachypus, Holmgr. Sv. Ak. Handl. 1858, p. 130; Thoms. Ann. Soc. Ent. France, 1885, p. 342, ♂ ♀.

A black and distinctly slender species with the orbits stramineous white, the legs rufescent and hind ones black-marked. Head little constricted posteriorly, with occiput broadly but not deeply emarginate; face punctate and centrally elevated; ♀ with mouth, mandibles except apically and the inner orbits pale flavous, ♂ also with orbits broadly, the cheeks apically, clypeus and face flavidous. Antennae piceous, of ♀ shorter than, of ♂ basally paler beneath and about length of, the body. Thorax narrower than head, black with its disc and sides more or less red-marked and more extensively in ♂, whose prothorax is usually flavidous; pleurae sparsely punctate and centrally glabrous; metathorax with complete upper areae. Abdomen narrow and rather longer than head and thorax, black with second segment apically testaceous and the third rarely badius; basal segment slightly curved and the second longer than broad; hypopygium of ♀ prominent and terebra as long as basal segment. Legs slender and rufescent or in ♂ flavidous, with the anterior basally paler; extreme base and apex of hind tibiae, and their tarsi, piceous; onychii stout and claws only basally pectinate. Wings hyaline, with stigma usually piceous and tegulae whitish; areolet somewhat large, emitting recurrent nervure slightly before its centre; basal nervure continuous. Length, 6 mm.

Similar and allied to *M. pectoralis* in colour, etc., but with the flagellum basally pale and less slender, the wings less pure hyaline with the areolar petiole a little longer, the thorax strongly elongate with the petiolar area a little longer, the terebra stouter and the frontal orbits with a dilated stramineous mark above scrobes.

It has not been bred on the Continent, where it occurs in France, Sweden and Belgium during May, July and September. But in Britain Cross raised it from *Eupithecia minutata*, Gn., var. *Knautiata*, Greg. (Trans. Ent. Soc. 1886, p. 353); subsequently Bridgman found it at Salhouse and Norwich, and recorded W. Fletcher's breeding from *Eupithecia lariciata* (Norf. List). I possess two males: bred by Dr. Cassal at Medge Hall near Doncaster in 1901 from *Eupithecia* ? *linariata* feeding on toad-flax; and taken by myself early in July, 1900, flying along the edge of a field immediately after rain at Southwold in Suffolk.

23. *anomalus*, Holmgr.

Mesochorus anomalus, Holmgr. Sv. Ak. Handl. 1858, p. 130; Brisch. Schr. Nat. Ges. Danz. 1880, p. 182; Thoms. Ann. Soc. Ent. France, 1885, p. 342, ♂ ♀.

A black species with the abdomen centrally, and the legs, red; apices of hind tibiae black. Head somewhat constricted posteriorly, testaceous with mouth paler, vertex and ocellar region and occiput nigrescent; cheeks not short. Antennae pale and fully as long as body. Thorax longer than high, with callosities before radices and the ♂ pleurae rufes-

cent; mesonotum, especially of ♂, usually aciculate; metathorax with complete upper areae and centre of petiolar area nearly double length of its sides. Scutellum often red. Abdomen hardly longer than head and thorax, black with first segment basally dull testaceous, apex of second subtriangularly rufescent and third discally red to beyond its centre; following segments of ♀ laterally pale, and the ♂ styls and ventral plica flavidous; basal segment slightly curved, with postpetiole usually foveate; second and third segments transverse; terebra subulate, very slender and shorter than basal segment. Legs testaceous with hind tarsi concolorous, their tibiae nigrescent at both extremities, and coxae usually discally infuscate-marked. Wings hyaline with tegulae whitish, and the apically curved radius basally emitted from apical third of the narrow and testaceous stigma; areolet large and sessile, emitting recurrent nervure slightly before its centre; lower basal nervure antefurcal. Length, 5-6 mm.

The last four species of this genus differ from all the preceding, except perhaps the conspicuous first group (before *M. vitticollis*), in their small size and in having the ocelli not large, the flagellum usually slender and filiform, occipital line behind the eyes often slender or obsolete, lower basal nervure usually postfurcal, second recurrent somewhat short and but slightly longer than breadth of the often sessile areolet, abdomen apically compressed from base of third segment with the second transverse and broader apically, terebra slender and nearly subulate though not short, hind calcaria not extending to centre of metatarsi, and both claws and pulvilli small.

This species appears but little known, though vaguely recorded from north and central Europe by Thomson; Brischke gives some colour forms as doubtfully belonging to it, which he bred from *Microgaster* cocoons out of *Plusia gamma*, *Cucullia asteris* and *C. argentea*, and *Argynnis Latonia* larvae in Prussia. In Britain Capron records it from the neighbourhood of Shere in 1879 (Entom. 1880, p. 89), though it is not now in his collection; Olliff bred it from *Nola cucullatella* (*lib. cit.* 1883, p. 67); and Bignell in Devon from *Euchelia Jacobaeae* through *Apanteles popularis* on 20th July.

24. *pictilis*, Holmgr.

Mesochorus tipularius, Gr. I.E. ii. 964, ♀; Brisch. Schr. Nat. Ges. Danz. 1880, p. 182, ♂ ♀; cf. Westw. Mod. Class. ii. Synop. 58 (?). *M. pictilis*, Holmgr. Sv. Ak. Handl. 1858, p. 131; Thoms. Ann. Soc. Fr. 1885, p. 342, ♂ ♀.

Black with the abdomen centrally, and legs, pale; cheeks elongate and buccate. Head little constricted posteriorly, testaceous with the mouth paler; mandibular apices, ocellar region, vertex and occiput black; cheeks elongate, buccate and aciculate. Antennae piceous and basally paler beneath. Thorax longer than high and flavidous, with its disc entirely black; metathorax with complete upper areae. Abdomen black with apex of second segment testaceous, anus of ♀ sometimes apically rufescent; ventral plica and anal styls of ♂ flavidous; basal segment nearly straight, the two following transverse and terebra hardly shorter than first segment. Legs flavidous, the hind femora narrowly rufescent; hind tibiae subincrassate and at both extremities slightly infuscate; their tarsi piceous and basally paler. Wings hyaline with stigma pale, tegulae whitish and lower basal nervure a little postfurcal. Length, 5 mm.

Similar and allied to *M. anomalus*, but with at most apical margin of second segment, the sternum and more convex face testaceous, the eyes small, cheeks elongate and both buccate and striolate, and the hind tibiae whitish with their apices hardly infusate.

France, Sweden, etc. With us it would appear rare; Haliday took *M. Tipularius* in larch plantations in Galway (Curtis, B.E. 494) and Bignell once bred the present species in Devon on 20th June from *Iodis lactaria* through an *Apanteles* cocoon (Devon List *et* Entom. 1883, p. 67). In September, 1906, Roebuck sent me a bundle of *A. spurius* cocoons from Liversedge in Yorks, from which emerged both sexes of this hyperparasite; and in November, 1899, I found a female had emerged from *Liparis auriflua*, through *Microgaster connexus*, sent by Prideaux, probably from Reigate in Surrey.

25. *facialis*, Bridg.

Mesochorus facialis, Bridg. Trans. Ent. Soc. 1884, p. 431; Thoms. Ann. Soc. Ent. Fr. 1885, p. 343, ♂ ♀.

A rufescent-testaceous species with sparse black-markings; the hind tibiae shortly black-lined basally, and their apical third black. Head posteriorly constricted and in ♀ discally piceous; face transverse and apically aciculate on either side; mandibular teeth of equal length. Antennae mainly piceous. Thorax glabrous and nitidulous; of ♀ discally piceous with sternum and the smooth mesopleurae also infusate, of ♂ with lateral piceous mesonotal vittae; metathorax with complete upper areae, and in ♂ basally nigrescent. Abdomen glabrous and nitidulous, black with the anus, a large central spot on second and third segments, and sometimes base of the first, testaceous; sides of basal segment hardly margined, second longer than broad; third segment slightly broader than long, and terebra not quite as long as basal segment. Legs of normal length, testaceous with extreme base and apex of hind tibiae darker; their tarsi pale, apically infusate. Stigma piceous and tegulae whitish; areolet broad, emitting recurrent nervure far before its centre, radius apically curved; lower basal nervure a little postfurcal. Length, 4-5 mm.

The ♀ differs from the ♂ only in having the thorax and disc of head darker, with sternum and mesopleurae infusate.

Thomson says this species is similar to his Swedish *M. acuminatus*, which differs from *M. anomalus* in its shorter cheeks and colouration of second segment and apically not obtuse ♂ styli, in having the second segment triangularly flavescent to its centre, but with the areolet broad and transverse, emitting the recurrent nervure far before its centre, the paler body and hind tibial colouration.

Not yet bred on the Continent and only recognised from Denmark, Sweden and Germany. In Devonshire it has been thrice raised during June by Bignell from *Euchelia jacobaeae* through *Apanteles popularis*, whence the type emerged in 1884 (Bignell's List; quoted by Marsh. Bracon. d'Europ. i. 470); three, bred on 19th July, 1883, he has given me; and I possess others from Capron's Surrey collection, and two bred by South on 24th July, 1902, from *Liparis similis* at Otford in Kent.

26. *angustatus*, *Thoms.*

Mesochorus angustatus, Thoms. Ann. Soc. Ent. France, 1885, p. 343; Schm. Opusc. Ichn. 2003, ♂ ♀.

Black with apical margin of the second segment whitish, the basal nervure continuous, and petiolar area short. Head with orbits, except at vertex, narrowly testaceous; palpi, clypeus, genal apices, and mandibles except apically, flavous; ♂ face pale piceous. Antennae black, with basal joints of ♂ flavidous beneath. Thorax of ♀ black with only radical callosities whitish, of ♂ with two obsolete pale mesonotal vittae. Abdomen black with the second segment apically and third of ♀ indistinctly, and of ♂ quadrately, in its centre rufescent or in ♂ whitish; anal styli of ♂ very narrow and half length of basal segment. Legs dull testaceous, with the anterior paler; hind coxae of ♀ broadly and especially discally nigrescent, of ♂ paler; apices of hind tibiae somewhat broadly, their base and femoral apices, infuscate. Stigma nigrescent with its base and apex whitish, as also are the tegulae; areolet of ♂ very rarely nearly sessile. Length, 3-5 mm.

From the last three species this differs in the petiolate alar areolet emitting the recurrent nervure from its centre, the hind coxae and a central facial mark nigrescent, the face apically constricted, and the somewhat elongate ♂ anal styli black.

Thomson described this species from Swedish *Microgaster glomeratus*; and subsequently Schmiedeknecht raised a pair from the same Braconid in larvae of *Pieris brassicae* in Germany. Not hitherto noted as British, though doubtless common; Capron had a full series from the vicinity of Shere, on 10th November Parkes sent me a dead female bred in 1900 from a batch of *Apanteles spurius* cocoons from Wednesbury, and on 15th June I have swept it at Horning Ferry in the Norfolk Broads.

STICTOPISTHUS, *Thomson.*

Thoms. Ann. Soc. Ent. France, 1885, p. 344.

A genus of small species, not exceeding some five mm. in length. Head with the face convex and the vertex not narrow. Thorax with the basal scutellar fovea transversely linear and metathoracic costae complete. Abdominal terebra stout and at most half the length of basal segment, which has the spiracles central and the postpetiole irregularly punctate. Legs stout. Wings with areolet broadly sessile; lower basal nervure postfurcal; parallel nervure emitted from a little below centre of brachial cell; nervellus not intercepted, generally oblique and antefurcal. Face broad and the scrobes further from each other than from the eyes.

Known by the position of the parallel nervure, the incontinuous basal nervure, short terebra and postpetiolar subaciculation. One species is still of somewhat uncertain location, forming a link between the present genus and the last section of the main genus, just dealt with.

Table of Species.

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|---------|--|-----------------------------|
| (2). 1. | Testaceous-marked, with the mesonotum not punctate | 1. COMPLANATUS, <i>Hal.</i> |
| (1). 2. | Not testaceous-marked; mesonotum distinctly punctate. | |

- (4). 3. Red-marked; head broader than thorax; pleurae punctate . . . 2. *LATICEPS*, *Thoms.*
 (3). 4. Not red-marked; head normal; pleurae smooth.
 (6). 5. Mesonotum deplanate; ♀ face apically infusate 3. *FORMOSUS*, *Bridg.*
 (5). 6. Mesonotum distinctly convex; ♀ face centrally infusate 4. *CONVEXICOLLIS*, *Thoms.*

1. *complanatus*, *Hal.*

Mesochorus complanatus, Hal. Ann. Nat. Hist. 1839, p. 114; Holmgr. Sv. Ak. Handl. 1858, p. 131; Brisch. Schr. Nat. Ges. Danz. 1880, p. 182, ♂ ♀; *lib. cit.* 1892, p. 46, ♂. *M. aciculatus*, Bridg. Trans. Ent. Soc. 1881, p. 162, pl. viii, fig. 11, ♀; *Stictopisthus aciculatus*, Thoms. Ann. Soc. Ent. Fr. 1885, p. 344, ♂ ♀. (?) *M. tipularius*, Ratz. Ichn. d. Forst. iii. 120, ♀ (*nec* Grav.).

A testaceous- and black-marked species with the mesothorax elongate. Head not very strongly buccate, testaceous with the ocellar region and mandibular apices nigrescent; temples broad and punctate; eyes rather small and face convex. Antennae hardly longer than body, of ♂ piceous and basally paler beneath. Thorax finely and minutely punctate, discally deplanate; of ♀ infusate piceous and sometimes rufescent below radices, of ♂ discally black and ventrally stramineous; mesonotum and mesosternum longer than broad, with pleurae strongly and sparsely punctate, centrally smooth; upper metathoracic areae complete and subdistinct. Abdomen slightly shorter than head and thorax, glabrous and nitidulous; black with apex of second, in ♀ base and in ♂ whole of third segments testaceous; the following piceous and anus pale, as in ♂ is part of fourth segment; basal segment stout and hardly as long as hind trochanters, with petiole distinctly shorter than the apically rugose-aciculate and subapically impressed postpetiole, and the following segments all transverse; terebra short. Legs not very stout; of ♀ fulvous with tarsi paler, hind coxae partly and apices of their tibiae infusate; of ♂ flavidous with tarsal joints apically infusate; base of claws indistinctly pectinate. Wings hyaline with stigma dull piceous and tegulae whitish; radius a little curved apically; basal nervure not continuous. Length, 5 mm.

Easily distinguished by its elongate body, discally deplanate mesonotum, the sparsely and somewhat strongly punctate pleurae and by the mesosternum being longer than broad. Thomson terms the species *S. aciculatus* of Haliday, doubtless a *lapsus calami* for Bridgman; Schmiedeknecht synonymises the two latter authors' names without comment.

North and central Europe; France and rare in Sweden. It has not been bred on the Continent, but Bridgman's type was described from a female bred in Devon on 17th September from *Pieris brassicae* through *Apanteles glomeratus* by Bignell, who subsequently raised other specimens on 8th July from *Pterophorus leucii* through *Limneria ruficincta*; Buckler adds *Pieris rapae* and *Abraaxas grossulariata* as hosts. I have twice captured it in Suffolk, in the Bentley Woods towards the end of May and by sweeping after dark at Herringswell Fen in August.

2. *laticeps*, Thoms.

Stictopisthus laticeps, Thoms. Ann. Soc. Ent. France, 1885, p. 344, ♂ ♀.

A black species with red markings, the head broader than thorax and constricted behind the eyes. Length, 4-5 mm.

This shortly diagnosed species is known from the last by the form of the head, the convex face, the short and setaceous and stouter antennae, the discally punctate mesonotum which is deplanate before the scutellum, and by the stouter legs.

"Patria: Suecia et Anglia" (Thoms.); bred by Fletcher from *Gelechia notatella* found in Wicken Fen, Cambridgeshire, during June, 1885 (Trans. Ent. Soc. 1886, p. 353). I have taken it at Reydon and on fennel flowers at Alderton in Suffolk; Ranworth Broad in Norfolk; Capron had one from Shere in Surrey; and Peachell has sent it me from Weymouth, bred through *Apanteles* species from *Abraxas grossulariata* in the middle of June.

3. *formosus*, Bridg.

Mesochorus formosus, Bridg. Trans. Ent. Soc. 1882, p. 154; Thoms. Ann. Soc. Ent. Fr. 1885, p. 343, ♂ ♀. *Stictopisthus formosus*, Schm. Opusc. Ichn. p. 2008, ♂ ♀.

Black with the abdomen centrally and legs flavous, basal nervure nearly continuous through the median. Head constricted posteriorly, flavous with ocellar region and mandibular apices nigrescent and ♀ face apically infuscate; face quadrate, clypeus apically rounded, not basally discreted and mandibular teeth of subequal length. Antennae longer than body with first flagellar joint half as long again as second and about six times longer than broad; of ♂ testaceous, with scape flavous beneath. Thorax smooth and infuscate; of ♀ nearly entirely black; areola elongate with its sides centrally explanate. Abdomen slender and nigrescent with a flavidous longitudinal mark from centre of second to that of third segment, and the anus laterally piceous; basal segment slightly longer than hind trochanters, with postpetiole somewhat irregularly aciculate; second a little longer than broad, and the third quadrate and apically strongly constricted, with anus thence distinctly compressed; anal styli of ♂ stramineous; terebra about as long as basal segment. Legs pale flavous, with only hind tibiae apically piceous. Wings hyaline with stigma and nervures dull white, tegulae stramineous; areolet emitting recurrent nervure before its centre; basal nervure continuous; nervellus not intercepted. Length, 3-4 mm.

Thomson placed this species in *Mesochorus* proper, doubtless on account of its continuous basal nervure and elongate terebra; but Schmiedeknecht was surprised at his doing so, on account of the postpetiolar sculpture, which he considers typically that of the present genus. The former thought it very similar to *M. anomalus* though with the second segment triangularly flavescent as in *M. facialis*, the cheeks and petiolar area a little shorter, the head strongly constricted and the hind calcaria a little shorter.

It does not appear to be rare in northern and central Europe, though not yet much known. Both sexes were described from examples bred by

Bignell from *Noctua triangulum* through *Macrocentrus collaris* (Entom. 1883, p. 67) and *Xylina rhizolita* through *Macrocentrus thoracicus* (Bridg. l.c.). Also bred early in July from *Petasia cassinea* through *Apanteles fulvipes* and in the middle of the same month from *Diloba caerulocoephala* through *Apanteles difficilis*, in Devon (Bignell, List), as well as from *Amphydasis prodromaria* through the last named Braconid (Buckler, vii).

4. *convexicollis*, Thoms.

Stictopisthus convexicollis, Thoms. Ann. Soc. Ent. France, 1885, p. 344, ♂ ♀.

Black, with the mesonotum somewhat convex and finely punctate. Length, 3-4 mm.

Similar and allied to *S. laticeps*, but with the head less broad and posteriorly hardly narrowed, the ♀ face centrally infusate, the antennae more slender, mesonotum more finely punctate, pleurae smooth and nervellus nearly vertical.

Described from Sweden. Bred at Norwich from a leaf-rolling larva, found on a hazel bush (Bridg. Trans. Norf. Soc. 1894, p. 623; cf. Trans. Ent. Soc. 1886, p. 354).

Catalogue.

A CLASSIFIED LIST OF THE BRITISH OPHIONINAE AS ENUMERATED
IN THIS VOLUME.

Order. HYMENOPTERA.

Section. ICHNEUMONIDEA.

Family. ICHNEUMONIDAE.

Sub-Family. OPHIONINAE.

Tribe. PLECTISCIDES.

HOLOMERISTUS, *Först.*

1. tenuicinctus, *Först.*

PLECTISCUS, *Grav.*

1. collaris, *Grav.*
2. eury stigma, *Thoms.*
3. tener, *Först.*
4. canaliculatus, *Först.*
5. terebrator, *Först.*
6. melanocerus, *Först.*
7. communis, *Först.*

APERILEPTUS, *Först.*

1. albipalpus, *Grav.*

PROCLITIS, *Först.*

1. praetor, *Hal.*
2. socius, *Hal.*
3. comes, *Hal.*
4. paganus, *Hal.*

EUSTERINX, *Först.*

1. obscurella, *Först.*

MEGASTYLUS, *Schödd.*

1. cruentator, *Schödd.*
2. conformis, *Först.*

DICOLUS, *Först.*

1. pectoralis, *Först.*
2. subtiliventris, *Först.*
3. insectator, *Först.*

HELICTES, *Hal.*

1. erythrostomus, *Gmel.*
2. mediator, *Schödd.*
3. borealis, *Holmgr.*
4. varius, *Hal.*

MIOMERIS, *Först.*

1. aquisgranensis, *Fst.*

Tribe. PORIZONIDES.

PORIZON, *Fall.*

1. exhaustator, *Fab.*
2. dissimilis, *Grav.*
3. gravipes, *Grav.*
4. angustipennis, *Holmgr.*
5. claviventris, *Grav.*
6. harpurus, *Schr.*

DIAPARSUS, *Thoms.*

1. geminus, *Holmgr.*
2. versutus, *Holmgr.*
3. erythrostomus, *Grav.*
4. nutritor, *Fab.*
5. gilvipes, *Grav.*
6. rufipes, *Holmgr.*
7. microcephalus, *Grav.*

THERSILOCHUS, *Holmgr.*

1. melanarius, *Holmgr.*
2. boops, *Grav.*
3. nigrutilus, *Grav.*
4. minutus, *Bridg.*
5. nitidus, *Bridg.*
6. morionellus, *Holmgr.*
7. triangularis, *Grav.*
8. rufiventris, *Brisch.*
9. truncorum, *Holmgr.*
10. marginatus, *Bridg.*
11. jocator, *Fab.*
12. carinatus, *Bridg.*
13. Orchesiae, *Morl.*
14. moderator, *Holmgr.*
15. saltator, *Fab.*

Tribe. CREMASTIDES.

CREMASTUS, *Grav.*

1. geminus, *Grav.*
2. bellicosus, *Grav.*
3. spectator, *Grav.*
4. pungens, *Grav.*
5. decoratus, *Grav.*
6. interruptor, *Grav.*
7. infirmus, *Grav.*

Tribe. CAMPOPLEGIDES.

CHAROPS, *Holmgr.*

1. decipiens, *Grav.*

CAMPOPLEX, *Grav.*

1. carinifrons, *Holmgr.*
2. rugulosus, *Först.*
3. rugifer, *Först.*
4. falcator, *Fab.*
5. oblitteratus, *Holmgr.*
6. oxyacanthae, *Boie.*
7. angustatus, *Thoms.*
8. terebrator, *Först.*
9. nitidulator, *Holmgr.*
10. myrtillus, *Desv.*
11. femorator, *Bridg.*
12. cultrator, *Grav.*
13. pugillator, *Linn.*
14. foveolatus, *Först.*

CAMPOPLEX—*continued.*

15. xenocamptus, *Först.*
16. anceps, *Holmgr.*
17. confusus, *Först.*
18. lapponicus, *Holmgr.*
19. bucculentus, *Holmgr.*
20. punctatus, *Bridg.*
21. juvenilis, *Först.*
22. costulatus, *Bridg.*
23. leptogaster, *Holmgr.*
24. incompletus, *Bridg.*
25. erythrogaster, *Först.*
26. monozonus, *Först.*
27. obreptans, *Först.*
28. disclusus, *Först.*
29. zonellus, *Först.*
30. sobolicida, *Först.*
31. tenuis, *Först.*
32. Mariae, *Schm.*

SAGARITIS, *Holmgr.*

1. brachycera, *Thoms.*
2. agilis, *Holmgr.*
3. declinator, *Grav.*
4. femoralis, *Grav.*
5. raptor, *Zett.*
6. Holmgreni, *Tschek.*
7. postica, *Bridg.*
8. punctata, *Bridg.*
9. erythropus, *Thoms.*
10. maculipes, *Tschek.*
11. zonata, *Grav.*
12. latrator, *Grav.*
13. incisa, *Bridg.*
14. annulata, *Grav.*

CYMODUSA, *Holmgr.*

1. cruentata, *Grav.*
2. leucocera, *Holmgr.*
3. exilis, *Holmgr.*
4. antennator, *Holmgr.*

CASINARIA, *Holmgr.*

1. vidua, *Grav.*
2. orbitalis, *Grav.*
3. morionella, *Holmgr.*
4. pallidipes, *Brisch.*
5. claviventris, *Holmgr.*
6. moesta, *Grav.*
7. ischnogaster, *Thoms.*

LIMNERIUM, *Ashm.*

1. albidum, *Gmel.*
2. geniculatum, *Grav.*
3. annulator, *Zett.*
4. rufifemur, *Thoms.*
5. xanthostoma, *Grav.*
6. deficiens, *Grav.*
7. arvense, *Grav.*
8. Paniscus, *Grav.*
9. alienatum, *Grav.*
10. monticolanum, *Bridg.*
11. renominatum, *Morl.*

PYRACMON, *Holmgr.*

1. obscuripes, *Holmgr.*
2. montanus, *Hartig.*

CANIDIELLA, *Ashm.*

1. tristis, *Grav.*
2. subcincta, *Grav.*
3. exigua, *Grav.*
4. trochantella, *Thoms.*
5. immolator, *Grav.*

NEPIESTA, *Thoms.*

1. aberrans, *Grav.*

NEMERITIS, *Holmgr.*

1. transfuga, *Grav.*
2. cremastoides, *Holmgr.*
3. rufipes, *Bridg.*
4. sordida, *Grav.*
5. gracilis, *Grav.*
6. lativentris, *Thoms.*
7. canescens, *Grav.*

PHOBOCAMP, *Thoms.*

1. crassiuscula, *Grav.*
2. uncinata, *Grav.*
3. bicingulata, *Grav.*
4. obscurella, *Holmgr.*

SPUDASTICA, *Thoms.*

1. Kriechbaumeri, *Bridg.*

ECPHOROPSIS, *Ashm.*

1. Viennensis, *Grav.*
2. fuscipes, *Holmgr.*
3. affinis, *Parf.*

OMORGA, *Thoms.*

1. mutabilis, *Holmgr.*
2. Faunus, *Holmgr.*
3. molesta, *Grav.*
4. difformis, *Gmel.*
5. ramidula, *Brisch.*
6. ovata, *Brisch.*
7. borealis, *Zett.*
8. cursitans, *Holmgr.*
9. lugubrina, *Holmgr.*
10. melanosticta, *Grav.*
11. ensator, *Grav.*
12. tumidula, *Grav.*
13. multicincta, *Grav.*
14. fasciata, *Bridg.*

LATHROPLEX, *Thoms.*

1. infernalis, *Grav.*

GONOTYPA, *Thoms.*

1. melanostoma, *Thoms.*

NEPIERA, *Thoms.*

1. concinna, *Holmgr.*
2. clypeata, *Brisch.*

TRANOSEMA, *Thoms.*

1. robusta, *Woldst.*
2. pedella, *Holmgr.*

OLESICAMPA, *Thoms.*

1. auctor, *Grav.*
2. gracilipes, *Thoms.*
3. fulviventris, *Gmel.*
4. binotata, *Thoms.*
5. longipes, *Müll.*
6. pagana, *Holmgr.*
7. nigroplica, *Thoms.*
8. simplex, *Thoms.*
9. sericea, *Holmgr.*

MELOBORIS, *Holmgr.*

1. dorsalis, *Grav.*
2. stagnalis, *Holmgr.*
3. inculcator, *Grav.*
4. rufiventris, *Grav.*
5. litoralis, *Holmgr.*
6. ischnocera, *Thoms.*
7. crassicornis, *Grav.*

PECTENELLA, *Morl.*

1. latungula, *Thoms.*

ANGITIA, *Holmgr.*

1. insectator, *Schr.*
2. parvula, *Grav.*
3. annulicrus, *Thoms.*
4. coleophorarum, *Ratz.*
5. alternans, *Grav.*
6. ruficornis, *Bridg.*
7. nana, *Grav.*
8. Elishae, *Bridg.*
9. annulipes, *Bridg.*
10. croceipes, *Marsh.*
11. pusio, *Holmgr.*
12. crassa, *Bridg.*
13. sordipes, *Thoms.*
14. aculeata, *Bridg.*
15. apostata, *Grav.*
16. rufipes, *Grav.*
17. claripennis, *Thoms.*
18. majalis, *Grav.*
19. albonotata, *Bridg.*
20. fenestralis, *Holmgr.*
21. chrysosticta, *Grav.*
22. lateralis, *Grav.*
23. cerophaga, *Grav.*
24. cylindrica, *Brisch.*
25. armillata, *Grav.*
26. tibialis, *Grav.*
27. virginalis, *Grav.*
28. gracilis, *Bridg.*
29. vestigialis, *Ratz.*
30. curvicauda, *Holmgr.*
31. rufata, *Bridg.*
32. interrupta, *Holmgr.*
33. exareolata, *Ratz.*
34. reticulata, *Bridg.*
35. Fitchi, *Bridg.*
36. combinata, *Holmgr.*
37. variabilis, *Bridg.*
38. tripunctata, *Bridg.*

ANILASTA, *Thoms.*

1. braccata, *Gml.*
2. rapax, *Grav.*
3. notata, *Grav.*
4. ebenina, *Grav.*
5. carbonaria, *Ratz.*
6. ruficincta, *Grav.*

ANILASTA—*continued.*

7. Barretti, *Bridg.*
8. dolosa, *Grav.*
9. caedator, *Grav.*
10. rufa, *Bridg.*
11. tricineta, *Holmgr.*
12. clausa, *Brisch.*
13. inquinata, *Holmgr.*
14. coxalis, *Brisch.*
15. placida, *Desv.*
16. Brischei, *Bridg.*

HOLOCREMNA, *Thoms.*

1. incrassator, *Holmgr.*
2. clandestina, *Holmgr.*
3. erythropyga, *Holmgr.*
4. argentata, *Grav.*
5. pubescens, *Ratz.*

Tribe. PRISTOMERIDES.

PRISTOMERUS, *Curt.*

1. vulnerator, *Panz.*

Tribe. ANOMALIDES.

SCHIZOLOMA, *Wesm.*

1. amicta, *Fab.*
2. capitata, *Desv.*

EXOCHILUM, *Wesm.*

1. circumflexum, *Linn.*
2. brevicorne, *Grav.*

HETEROPELMA, *Wesm.*

1. calcator, *Wesm.*

TRICHOMMA, *Wesm.*

1. enecator, *Rossi.*
2. fulvidens, *Wesm.*

ERIGORGUS, *Först.*

1. perspicillator, *Grav.*
2. insidiator, *Först.*
3. carinatus, *Brisch.*
4. fibulator, *Grav.*
5. Heros, *Wesm.*
6. melanobatus, *Grav.*

ANOMALON, *Jurine*.

1. latro, *Schr.*
2. cerinops, *Grav.*
3. procerum, *Grav.*
4. biguttatum, *Grav.*
5. ruficorne, *Grav.*
6. xanthopus, *Schr.*
7. bellicosum, *Wesm.*

LABRORYCHUS, *Först.*

1. nigricornis, *Wesm.*
2. clandestinus, *Grav.*
3. tenuicornis, *Grav.*
4. debilis, *Wesm.*

AGRYPON, *Först.*

1. tenuitarsum, *Grav.*
2. anomelas, *Grav.*
3. variitarsum, *Grav.*
4. nigripes, *Bridg.*
5. interruptum, *Desv.*
6. canaliculatum, *Holmgr.*
7. minutum, *Bridg.*
8. flaveolatum, *Grav.*
9. septentrionale, *Holmgr.*
10. anxium, *Wesm.*
11. arquatum, *Grav.*
12. insignis, *Först.*
13. geniculatum, *Holmgr.*

GRAVENHORSTIA, *Boie*.

1. picta, *Boie*.

Tribe. **OPHIONIDES.**NOTOTRACHYS, *Marsh.*

1. foliator, *Fab.*

OPHION, *Fab.*

1. Mocsaŕyi, *Brauns.*
2. luteus, *Linn.*
3. calcaratus, *Morl.*
4. distans, *Thoms.*
5. parvulus, *Kriech.*
6. forticornis, *Morl.*
7. stigmaticus, *Morl.*
8. longigena, *Thoms.*

OPHION—*continued.*

9. longicornis, *Brauns.*
10. scutellaris, *Thoms.*
11. brevicornis, *Morl.*
12. obscurus, *Fab.*
13. minutus, *Kriech.*
14. ventricosus, *Grav.*
15. marginatus, *Grav.*
16. bombycivorus, *Grav.*
17. undulatus, *Grav.*

HENICOSPILUS, *Steph.*

1. repentinus, *Holmgr.*
2. ramidulus, *Linn.*
3. merdarius, *Grav.*
4. combustus, *Grav.*

Tribe. **PANISCIDES.**OPHELTES, *Holmgr.*

1. glaucopterus, *Linn.*

PANISCUS; *Schr.*

1. tarsatus, *Brisch.*
2. nigricarpus, *Thoms.*
3. virgatus, *Fourc.*
4. latungula, *Thoms.*
5. cristatus, *Thoms.*
6. melanurus, *Thoms.*
7. testaceus, *Grav.*
8. gracilipes, *Thoms.*
9. fuscicornis, *Holmgr.*
10. brachycerus, *Thoms.*
11. cephalotes, *Holmgr.*

ABSYRTUS, *Holmgr.*

1. luteus, *Holmgr.*

Tribe. **MESOCHORIDES.**ASTIPHROMMUS, *Thoms.*

1. alarius, *Grav.*
2. dorsalis, *Holmgr.*
3. graniger, *Thoms.*
4. mandibularis, *Thoms.*
5. strenuus, *Holmgr.*
6. scutellatus, *Grav.*
7. hamulus, *Thoms.*
8. pictus, *Brisch.*
9. tenuicornis, *Thoms.*
10. plagiatus, *Thoms.*

MESOCHORUS, *Grav.*

1. politus, *Grav.*
2. nigripes, *Ratz.*
3. tetricus, *Holmgr.*
4. temporalis, *Thoms.*
5. fulgurans, *Curt.*
6. pectenipes, *Bridg.*
7. vitticollis, *Holmgr.*
8. testaceus, *Grav.*
9. semirufus, *Holmgr.*
10. confusus, *Holmgr.*
11. fuscicornis, *Brisch.*
12. crassicus, *Thoms.*
13. thoracicus, *Grav.*
14. sylvarum, *Curt.*
15. dimidiatus, *Holmgr.*
16. crassimanus, *Holmgr.*

MESOCHORUS—*continued.*

17. vittator, *Holmgr.*
18. tenuiscapus, *Thoms.*
19. pallidus, *Brisch.*
20. pectoralis, *Ratz.*
21. brevipetiolatus, *Thoms.*
22. tachypus, *Holmgr.*
23. anomalus, *Holmgr.*
24. pictilis, *Holmgr.*
25. facialis, *Bridg.*
26. angustatus, *Thoms.*

STICTOPISTHUS, *Thoms.*

1. complanatus, *Hal.*
2. laticeps, *Thoms.*
3. formosus, *Bridg.*
4. convexicollis, *Thoms.*

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CATALOGUE

OF THE BRITISH

ICHNEUMONIDAE*

ICHNEUMONINAE

Tribe. **LISTRODROMIDES.**

LISTRODROMUS, Wesm.

1. nycthemerus, Gr.

NEOTYPUS, Fst.

2. lapidator, Fab.

Tribe. **JOPPIDES.**

HOPLISMENUS, Gr.

3. perniciosus, Gr.
4. albifrons, Gr.
5. maurus, Marsh [¹]

HYBOPHORUS, Tisch.

6. aulicus, Gr.

DINOTOMUS, Fst.

7. lapidator, Fab.
8. pictus, Kr.
9. spinosus, Morl.

AUTOMALUS, Wesm.

10. alboguttatus, Gr.

TROGUS, Pz.

11. lutorius, Fab.
12. exaltatorius, Pz.

PROTICHNEUMON, Th.

13. fusorius, L.
14. pisorius, L.
15. erythrogaster, Ste.
16. fuscipennis, Wesm.
17. disparis, Poda.
18. laminatorius, Fb.

COELICHNEUMON, Th. [²]

19. sugillatorius, L.
20. cyaniventris, Wesm.
21. fuscipes, Gm.
22. periscelis, Wesm.
23. sinister, Wesm.
24. leucocerus, Gr.
25. comitator, L.
26. derasus, Wesm.
27. bilineatus, Gr.
28. consimilis, Wesm.
29. lineator, Fab.
30. ruficauda, Wesm.
31. microstictus, Gr.
32. liocnemis, Thoms.
33. moestus, Gr.
34. impressor, Zett.
35. castaneiventris, Gr.

* This Catalogue is to be obtained from the author, printed on one side of paper for labelling, and without notes.

Tribe. **ICHNEUMONIDES.***Sub-tribe.* **Oxypygini.****STENICHNEUMON, Th.** [3]

- 36. *culpator*, Schr.
- 37. *pistorius*, Gr.
- 38. *trilineatus*, Gm.
- 39. *scutellator*, Gr. [4]
- 40. *rufinus*, Gr.
- 41. *ochropis*, Gm.
- 42. *pictus*, Gr.
- 43. *castaneus*, Gr.

CRATICHNEUMON, Th.

- 44. *luteiventris*, Gr.
- 45. *sicarius*, Gr.
- 46. *rubricosus*, Holmgr.
- 47. *ruficeps*, Gr.
- 48. *rufifrons*, Gr.
- 49. *nigritarius*, Gr.
- 50. *liostylus*, Th.
- 51. *dissimilis*, Gr.
- 52. *fabricator*, Fab.
- 53. *annulator*, Fab.
- 54. *pallidifrons*, Gr.
- 55. *fugitivus*, Gr.
- 56. *coruscator*, L.
- 57. *Gravenhorsti*, Fnsc.
- 58. *albilarvatus*, Gr.
- 59. *lanius*, Gr.
- 60. *variipes*, Gr.
- 61. *magus*, Wesm.

EUPALAMUS, Wesm.

- 62. *oscillator*, Wesm.
- 63. *Wesmaeli*, Th.

MELANICHNEUMON, Th.

- 64. *leucomelas*, Gm.
- 65. *dumeticola*, Gr.
- 66. *nudicoxa*, Th.
- 67. *bimaculatorius*, Pz.
- 68. *saturatorius*, L.
- 69. *perscrutator*, Wesm.
- 70. *Faunus*, Grav.
- 71. *erythraeus*, Gr.
- 72. *sanguinator*, Rssi.

BARICHNEUMON, Th.

- 73. *anator*, Fab.
- 74. *gemellus*, Gr.
- 75. *ridibundus*, Gr.
- 76. *sexalbatus*, Wesm.
- 77. *tergenus*, Gr.
- 78. *incubitor*, L.
- 79. *basiglyptus*, Kr.
- 80. *rufidorsatus*, Bdg.
- 81. *vacillatorius*, Gr.
- 82. *heracleanae*, Bdg.
- 83. *semirufus*, Gr.
- 84. *pulchellatus*, Bdg.
- 85. *eupitheciae*, Brsch.
- 86. *albicinctus*, Gr.
- 87. *plagiarius*, Wesm.
- 88. *derogator*, Wesm.
- 89. *bilunulatus*, Gr.
- 90. *vestigator*, Wesm.
- 91. *lepidus*, Gr.
- 92. *angustatus*, Wesm.
- 93. *chionomus*, Wesm.
- 94. *callicerus*, Gr.

ICHNEUMON, L.

- 95. *lugens*, Gr.
- 96. *deliratorius*, L.
- 97. *xanthorius*, Fst.
- 98. *sarcitorius*, L.

ICHNEUMON—*continued.*

- 99. lautatorius, Desv.
- 100. caedator, Gr.
- 101. multipictus, Gr.
- 102. memorator, Wesm. [5]
- 103. latrator, Fab.
- 104. subquadratus, Th.
- 105. spurius, Wesm.
- 106. analis, Gr.
- 107. Walkeri, Wesm.
- 108. molitorius, Gr.
- 109. crassifemur, Thms.
- 110. melanotis, Hlgr.
- 111. bucculentus, Wesm.
- 112. suspiciosus, Wesm.
- 113. languidus, Wesm.
- 114. terminatorius, Gr.
- 115. stramentarius, Gr.
- 116. computatorius, Müll.
- 117. inquinatus, Wesm.
- 118. militaris, Gr.
- 119. albicollis, Wesm.
- 120. extensorius, L.
- 121. gradarius, Wesm.
- 122. gracilentus, Wesm.
- 123. confusorius, Gr.
- 124. albiger, Wesm. [6]
- 125. tempestivus, Hlgr.
- 126. macrocerus, Th.
- 127. primatorius, Fst.
- 128. bisignatus, Gr.
- 129. bellipes, Wesm.
- 130. gracilicornis, Gr.
- 131. silaceus, Gr.
- 132. emancipatus, Wesm.
- 133. formosus, Gr.
- 134. quaesitorius, L.
- 135. Haglundii, Hlgr.
- 136. piceatorius, Wesm.
- 137. rufidens, Wesm.

ICHNEUMON—*continued.*

- 138. caloscelis, Wesm.
- 139. insidiosus, Wesm.
- 140. subcylindricus, Gr.
- 141. raptorius, Gr.
- 142. submarginatus, Gr.
- 143. quadrialbatus, Gr.
- 144. cessator, Müll.
- 145. stigmatorius, Ztt.
- 146. vulneratorius, Ztt.
- 147. haesitator, Wesm.

EXEPHANES, Wesm. [7]

- 148. hilaris, Gr.
- 149. occupator, Gr.

CHASMIAS, Ashm.

- 150. motatorius, Fab.
- 151. paludicola, Wesm.

Sub-tribe. Amblypygini.

LIMERODES, Wesm.

- 152. arctiventris, Boie.

HYPOMECEUS, Wesm.

- 153. quadriannulatus, Gr.

CTENICHNEUMON, Th.

- 154. sputator, Fab.
- 155. homocerus, Wesm.
- 156. castigator, Fab.
- 157. Panzeri, Wesm.
- 158. funereus, Frc.
- 159. fossorius, Gr.
- 160. inspector, Wesm.
- 161. melanocastaneus, Gr.
- 162. repentinus, Gr. [8]
- 163. mesocastaneus, Gr.
- 164. messorius, Gr.
- 165. divisorius, Gr.
- 166. haereticus, Wesm.
- 167. flavocinctus, Desv.

SPILICHNEUMON, Th.

- 168. Fabricii, Gr.
- 169. occisorius, Fab. [9]
- 170. Gravenhorsti, Wesm.
- 171. septemguttatus, Gr.

AMBLYTELES, Wesm.

- 172. punctus, Gr.
- 173. palliatorius, Gr.
- 174. trifasciatus, Gr.
- 175. litigiousus, Wesm.
- 176. crispatorius, L.
- 177. equitatorius, Pz.
- 178. atratorius, Fab. [11]
- 179. quadripunctorius, Müll.
- 180. monitorius, Pz.
- 181. glaucatorius, Fab.
- 182. pallidicornis, Gr.
- 183. vadatorius, Illig.
- 184. amatorius, Müll.
- 185. cerinthius, Gr.
- 186. negatorius, Fab.
- 187. indocilis, Wesm.
- 188. subsericans, Gr.
- 189. armatorius, Fst.
- 190. infractorius, Pz.
- 191. oratorius, Fab.
- 192. margineguttatus, Gr.
- 193. microcephalus, Ste. [12]
- 194. castaneopygus, Ste.
- 195. uniguttatus, Gr.
- 196. conspurcatus, Gr.

HEPIOPELMUS, Wesm.

- 197. variegatorius, Pz.
- 198. leucostigmus, Gr. [10]

ACOLOBUS, Wesm.

- 199. albimanus, Gr.

ANISOBAS, Wesm.

- 200. hostilis, Gr.

PROBOLUS, Wesm.

- 201. alticola, Gr.
- 202. concinnus, Wesm.

Sub-tribe. **Platyurini.**

ERISTICUS, Wesm.

- 203. clericus, Gr.

TRICHO LABUS, Th.

- 204. strigatorius, Gr.

EURYLABUS, Wesm.

- 205. dirus, Wesm.
- 206. larvatus, Chr.
- 207. torvus, Wesm.
- 208. tristis, Grav.
- 209. rufipes, Ste.

PRISTOCEROS, Gr.

- 210. serrarius, Gr.

PLATYLABUS, Wsm.

- 211. nigrocyanus, Gr.
- 212. rufus, Wesm.
- 213. pedatorius, Fab.
- 214. pumilio, Hlgr.
- 215. histrio, Wesm. [13]
- 216. phaleratus, Hal.
- 217. variegatus, Wesm.
- 218. dolorosus, Gr.
- 219. tenuicornis, Gr.
- 220. albinus, Gr.
- 221. semirufus, Desv.
- 222. orbitalis, Gr. [14]
- 223. tricingulatus, Gr.
- 224. decipiens, Wesm.

PLATYLABUS—*continued*.

- 225. rubellus, Gm.
- 226. nigricollis, Wesm.
- 227. pactor, Wesm.
- 228. dimidiatus, Gr.

Tribe. PHAEOGENIDES.

Sub-tribe. Heresiarchini.

STENODONTUS, Berth.

- 229. marginellus, Gr.

Sub-tribe. Phaeogenini.

APAELETICUS, Wesm.

- 230. bellicosus, Wesm.
- 231. inclytus, Wesm.

HERPESTOMUS, Wesm.

- 232. brunneicornis, Gr.
- 233. nasutus, Wesm.
- 234. furunculus, Wesm.
- 235. arridens, Gr.
- 236. distinctus, Bdg.

PHAEOGENES, Wesm.

- 237. argutus, Wesm.
- 238. similis, Bdg.
- 239. cephalotes, Wesm.
- 240. suspicax, Wesm.
- 241. acutus, Gr.
- 242. mitigosus, Gr.
- 243. stipator, Wesm.
- 244. semivulpinus, Gr.
- 245. planifrons, Wesm.
- 246. melanogonus, Gm.
- 247. ophthalmicus, Wesm.
- 248. modestus, Wesm.
- 249. fuscicornis, Wesm.

PHAEOGENES—*continued*.

- 250. trepidus, Wesm.
- 251. infimis, Wesm.
- 252. eques, Wesm.
- 253. ischiomelinus, Gr.
- 254. impiger, Wesm.
- 255. bellicornis, Wesm.
- 256. nanus, Wesm.
- 257. maculicornis, Ste.
- 258. mysticus, Wesm.
- 259. stimulator, Gr.
- 260. homochlorus, Wesm.
- 261. callopus, Wesm.
- 262. fulvitaris, Wesm.
- 263. coryphaeus, Wesm.
- 264. rusticatus, Wesm.
- 265. nitidus, Bdg. [15]

DIADROMUS, Wesm.

- 266. troglodytes, Gr.
- 267. subtilicornis, Gr.
- 268. varicolor, Wesm.
- 269. guttulatus, Gr.
- 270. candidatus, Gr.
- 271. conciliator, Wesm.
- 272. collaris, Gr.

EPITOMUS, Fst.

- 273. parvus, Thms.

OIORHINUS, Wesm.

- 274. pallidipalpis, Wesm.

AETHECERUS, Wesm.

- 275. longulus, Wesm.
- 276. placidus, Wesm.
- 277. nitidus, Wesm.
- 278. discolor, Wesm.
- 279. dispar, Wesm.

DICAELOTUS, Wesm.

- 280. *pumilus*, Gr.
- 281. *Cameroni*, Bdg.
- 282. *rufilimbatus*, Gr.
- 283. *ruficoxatus*, Gr.
- 284. *parvulus*, Gr.
- 285. *pusillator*, Gr.

COLPOGNATHUS, Wesm.

- 286. *celerator*, Gr.
- 287. *divisus*, Thms.
- 288. *jucundus*, Wesm.

CENTETERUS, Wesm.

- 289. *major*, Wesm.
- 290. *confector*, Gr.
- 291. *opprimator*, Gr.

ORONOTUS, Wesm.

- 292. *binotatus*, Gr.

NOTOSEMUS, Fst.

- 293. *albibuccus*, Kr. [16]

ISCHNUS, Gr.

- 294. *nigricollis*, Wesm.
- 295. *thoracicus*, Gr.

HETERISCHNUS, Wesm.

- 296. *pulex*, Müll.
- 297. *rufipes*, Wesm.

TRACHYARUS, Th.

- 298. *corvinus*, Thms.

HEMICHNEUMON, Wesm.

- 299. *elongatus*, Rtz.

NEMATOMICRUS, Wesm.

- 300. *tenellus*, Wesm.

MELANOMICRUS, Morl.

- 301. *Elliotti*, Morl.

Tribe. **ALOMYIDES**.**ALOMYIA**, Pz.

- 302. *debellator*, Fab.

CRYPTINAE. [17]

Tribe. **PHYGADEUONIDES**.*Sub-tribe.* **Phygadeuonini**.**HELCOSTIZUS**, Fst.

- 303. *brachycentrus*, Gr.

GIRAUDIA, Fst.

- 304. *congruens*, Gr.

COELOCRYPTUS, Th.

- 305. *rufinus*, Gr.

PLECTOCRYPTUS, Th.

- 306. *digitatus*, Gm.
- 307. *tarsatus*, Bdg. [18]
- 308. *leucopsis*, Gr.
- 309. *griseus*, Gr.
- 310. *tinctorius*, Gr.

TRICHOCRYPTUS, Th.

- 311. *cinctorius*, Fab.
- 312. *aquaticus*, Thms.

CRATOCRYPTUS, Th. [19]

- 313. furcator, Gr.
- 314. stomaticus, Gr.
- 315. anatorius, Gr.
- 316. subpetiolatus, Gr.
- 317. parvulus, Gr.

DEMOPHELES, Fst.

- 318. caliginosus, Gr.

CUBOCEPHALUS, Rtz.

- 319. fortipes, Gr.
- 320. nigriventris, Thms.
- 321. brevicornis, Tasch. [20]
- 322. oviventris, Gr.

MICROCRYPTUS, Th.

- 323. rufipes, Gr.
- 324. perspicillator, Gr.
- 325. arrogans, Gr.
- 326. flavopunctatus, Bdg.
- 327. subguttatus, Gr.
- 328. improbus, Gr.
- 329. rufoniger, Bdg.
- 330. graminicola, Gr.
- 331. Spinolae, Gr.
- 332. bifrons, Gm.
- 333. abductor, Gr.
- 334. errator, Msh.
- 335. arridens, Gr.
- 336. galactinus, Gr.
- 337. leucostictus, Gr.
- 338. nigrocinctus, Gr.
- 339. cretatus, Gr.
- 340. larvatus, Gr.
- 341. basizonius, Gr.
- 342. sericans, Gr. [21]
- 343. tricinctus, Grav.
- 344. erythrinus, Gr.

MICROCRYPTUS—*continued*.

- 345. sperator, Müll.
- 346. graviceps, Msh.
- 347. brachypterus, Gr.
- 348. micropterus, Gr.
- 349. labralis, Gr.

ACANTHOCRYPTUS, Th.

- 350. nigricollis, Thms.
- 351. flagitator, Rssi.
- 352. Hopei, Morl.
- 353. quadrispinosus, Gr.
- 354. nigritus, Gr.

OBISIPHAGA, Morl.

- 355. stenoptera, Msh.

CREMNODES, Fst.

- 356. atricapillus, Gr.

APTEROPHYGAS, Fst.

- 357. paradoxus, Bdg. [22]

GLYPHICNEMIS, Fst. [23]

- 358. profligator, Fab.
- 359. vagabunda, Gr.
- 360. Suffolciensis, Morl.
- 361. clypealis, Thms.
- 362. parviventris, Gr.
- 363. brevis, Gr.
- 364. erythrogaster, Gr.
- 365. senilis, Gm.

PHYGADEUON, Gr.

- 366. bitinctus, Gm.
- 367. rufulus, Gm.
- 368. nyctemerus, Gr.
- 369. speculator, Gr.
- 370. sodalis, Tasch.
- 371. procerus, Gr.

PHYGADEUON—*continued*.

- 372. Heinemanni, Fst.
- 373. Gravenhorsti, Fst.
- 374. vagans, Gr.
- 375. rusticellae, Bdg.
- 376. rugulosus, Gr.
- 377. Scoticus, Msh.
- 378. leucostigmus, Gr.
- 379. nanus, Gr.
- 380. brachyurus, Thms.
- 381. cephalotes, Gr.
- 382. flavimanus, Gr.
- 383. variabilis, Gr.
- 384. assimilis, Gr.
- 385. dumetorum, Gr.
- 386. exiguus, Gr.
- 387. mixtus, Bdg.
- 388. ambiguus, Gr. [24]
- 389. Marshalli, Bdg.
- 390. hercynicus, Gr.
- 391. brevitarsis, Thms.
- 392. nitidus, Gr.
- 393. ovatus, Gr.
- 394. fumator, Gr.
- 395. inflatus, Thms.
- 396. scaposus, Thms.
- 397. dimidiatus, Thms.
- 398. rotundipennis, Thms.

PANARGYROPS, Fst.

- 399. tenuipes, Gr.
- 400. collaris, Thms.
- 401. aereus, Gr.
- 402. pellucidator, Gr.
- 403. tenuis, Gr.
- 404. tenerimus, Gr.
- 405. claviger, Tasch.

ORESBIUS, Msh.

- 406. castaneus, Msh.

Sub-tribe. **HEMITELINI.***Group.* **Hemiteloides.**

ORTHOPELMA, Tasch.

- 407. luteolator, Gr.
- 408. brevicornis, Morl.

SPINOLIA, Fst.

- 409. maculipennis, Gr.
- 410. fulveolata, Gr.

HEMITELES, Gr.

- 411. pullator, Gr.
- 412. inustus, Gr.
- 413. fulvipes, Gr.
- 414. marginatus, Bdg.
- 415. submarginatus, Bdg.
- 416. scabriculus, Thms.
- 417. variitarsus, Gr.
- 418. capreolus, Thms.
- 419. conformis, Gm.
- 420. infirmus, Gr.
- 421. necator, Gr.
- 422. bicolorinus, Gr.
- 423. longicauda, Thms.
- 424. areator, Pz.
- 425. cingulator, Gr.
- 426. pictipes, Gr.
- 427. varicoxis, Tasch.
- 428. rufulus, Thms. [25]
- 429. castaneus, Tasch.
- 430. pedestris, Fab.
- 431. subzonatus, Gr.
- 432. contaminatus, Gr.
- 433. incisus, Bdg.
- 434. brunneus, Morl.
- 435. limbatus, Gr.
- 436. floricator, Gr.
- 437. albomarginatus, Bdg.

HEMITELES—*continued.*

- 438. niger, Tasch.
- 439. melanogaster, Thms.
- 440. tristator, Grav.
- 441. sordipes, Gr.
- 442. cynipinus, Thms.
- 443. similis, Gm.
- 444. auriculatus, Thms.
- 445. melanarius, Gr.
- 446. obscurus, Bdg.
- 447. laevigatus, Rtz.
- 448. biannulatus, Gr.
- 449. hemipterus, Fab.
- 450. scrupulosus, Gr.
- 451. chionops, Gr.
- 452. rufocinctus, Gr.
- 453. variicornis, Gr.
- 454. dubius, Gr.
- 455. ridibundus, Gr.
- 456. balteatus, Thms.
- 457. imbecillus, Gr.
- 458. persector, Parf.
- 459. tenuicornis, Gr.
- 460. oxyphimus, Gr.
- 461. meridionalis, Gr.
- 462. macrurus, Thms.
- 463. argentatus, Gr.
- 464. nitidus, Bdg.
- 465. decipiens, Gr.
- 466. stagnalis, Thms.
- 467. aestivalis, Gr.
- 468. hadrocerus, Thms.
- 469. minutus, Bdg.
- 470. gracilis, Thms.
- 471. solutus, Thms. [26]
- 472. micator, Gr.
- 473. subannulatus, Bdg.
- 474. melanopygus, Gr. [26]
- 475. anglicanus, Morl.

HEMITELES—*continued.*

- 476. distinctus, Bdg.
- 477. validicornis, Thms.
- 478. politus, Bdg.

OTACUSTES, Fst.

- 479. breviventris, Gr.

CECIDONOMUS, Bdg.

- 480. Westoni, Bdg.
- 481. xylonomoides, Morl.
- 482. inimicus, Gr.
- 483. gallicola, Bdg. [27]

Group. PEZOMACHOIDES.

PEZOMACHUS, Gr.

- 484. sylvicola, Fst.
- 485. aquisgranensis, Fst.
- 486. Kiesenwetteri, Fst.
- 487. zonatus, Fst.
- 488. vulpinus, Gr.
- 489. costatus, Bdg.
- 490. rufipes, Fst.
- 491. cautus, Fst.
- 492. aemulus, Fst.
- 493. vulnerans, Fst.
- 494. canaliculatus, Fst.
- 495. pilosus, Capron
- 496. acarorum, L.
- 497. mandibularis, Thms.
- 498. festinans, Gr.
- 499. hieracii, Bdg.
- 500. nigritis, Fst.
- 501. spinulus, Thms.
- 502. tener, Fst.
- 503. micrurus, Fst.
- 504. formicarius, Fab.
- 505. Mulleri, Fst.
- 506. vagantiformis, Bdg.

PEZOMACHUS—*continued*.

507. *distinctus*, Fst.
 508. *analis*, Fst.
 509. *attentus*, Fst.
 510. *tonsus*, Fst.
 511. *rotundiventris*, Fst. [28]
 512. *pumilus*, Fst.
 513. *gonatopinus*, Thms.
 514. *anthracinus*, Fst.
 515. *vagans*, Oliv.
 516. *fraudulentus*, Fst.
 517. *impotens*, Fst.
 518. *timidus*, Fst.
 519. *bicolor*, Gr.
 520. *ochraceus*, Fst.
 521. *modestus*, Fst.
 522. *agilis*, Gr.
 523. *pulicarius*, Fab.
 524. *tristis*, Fst.
 525. *carnifex*, Fst.
 526. *nigricornis*, Fst.
 527. *corruptor*, Fst. [29]
 528. *gracilis*, Fst.
 529. *brevis*, Bdg.
 530. *Steveni*, Gr.
 531. *instabilis*, Fst.
 532. *Forsteri*, Bdg.
 533. *cursitans*, Gr.
 534. *detritus*, Fst.
 535. *pedicularius*, Fab.
 536. *comes*, Fst.
 537. *fasciatus*, Fab. [29]
 538. *palpator*, Gr.
 539. *geochares*, Fst.
 540. *intermedius*, Fst.
 541. *indagator*, Fst.

THAUMATOTYPUS, Fst.

542. *Billupsi*, Bdg. [30]

Tribe. **STILPNIDES.**

PHRUDUS, Bdg.

543. *monilicornis*, Bdg. [31]

STILPNUS, Gr.

544. *gagates*, Gr.
 545. *pavoniae*, Scop.
 546. *dryadum*, Curt.
 547. *blandus*, Gr.
 548. *deplanatus*, Gr.

ATRACTODES, Gr.

549. *tenebricosus*, Gr. [32]
 550. *bicolor*, Gr.
 551. *gilvipes*, Hlgr.
 552. *citator*, Hal.
 553. *gravidus*, Gr.
 554. *compressus*, Thms.
 555. *albovinctus*, Hal. [33]
 556. *piceicornis*, Hal.
 557. *exilis*, Hal.
 558. *salius*, Hal.
 559. *croceicornis*, Hal.
 560. *foveolatus*, Gr.

EXOLYTUS, Hlgr.

561. *laevigatus*, Gr.
 562. *petiolaris*, Thms.
 563. *scrutator*, Hal.
 564. *splendens*, Gr.

CALLIDIOTES, Fst.

565. *luridator*, Gr. [34]

Tribe. **CRYPTIDES.**Sub-Tribe. **Mesostenini.**

NEMATOPODIUS, Gr.

566. *formosus*, Gr.
 567. *linearis*, Gr.

MESOSTENUS, Gr.

568. ligator, Gr.
 569. obnoxius, Gr.
 570. transfuga, Gr. [35]

Sub-tribe. Cryptini.

PYCNOCRYPTUS, Thms.

571. peregrinator, L.

SPILOCRYPTUS, Th.

572. incubitor, Ström.
 573. cimbicis, Tschek.
 574. migrator, Fab.
 575. fumipennis, Gr.
 576. abbreviator, Fab.
 577. adustus, Gr.
 578. nubeculatus, Gr.
 579. amoenus, Gr.

GAMBRUS, Fst.

580. tricolor, Gr.
 581. ornatus, Gr.

HOPLOCRYPTUS, Th.

582. bicingulatus, Gr.
 583. confector, Gr.
 584. fugitivus, Gr.
 585. nigripes, Gr.
 586. subcinctus, Gr.
 587. dubius, Tasch.

ARITRANIS, Fst. [36]

588. elegans, Desv.
 589. carnifex, Gr.
 590. rufus, Morl.
 591. signatorius, Fab.

IDIOLISPA, Fst.

592. analis, Gr.
 593. obfuscator, Vill.
 594. coarctata, Gr.

DEMOPHORUS, Th.

595. robustus, Brsch. [37]

GONIOCRYPTUS, Th.

596. titillator, L.
 597. plebejus, Tschek.

CRYPTUS, Fab.

598. cyanator, Gr.
 599. spiralis, Frc.
 600. moschator, Fab.
 601. tarsoleucus, Schr.
 602. lugubris, Gr.
 603. viduatorius, Fab.
 604. sponsor, Fab.
 605. apparitorius, Vill.
 606. attentorius, Schäf.
 607. obscurus, Gr.
 608. albatorius, Vill.
 609. Dianae, Gr.
 610. armatorius, Fab.
 611. minator, Gr.
 612. tuberculatus, Gr.

HABROCRYPTUS, Th.

613. porrectorius, Fab.
 614. brachyurus, Gr.
 615. alternator, Gr.
 616. minutorius, Fab.

CAENOCRYPTUS, Th.

617. rufiventris, Gr.
 618. antennatus, Bdg.

MEGAPLECTES, Fst.

619. monticola, Gr.

ACRORICNUS, Rtz.

620. macrobatus, Gr.

XYLOPHRURUS, Fst.

621. lancifer, Gr.

NYXEOPHILUS, Fst.

622. Corsicus, Msh.

PIMPLINAE.

Tribe. **XORIDIDES.**

ECHTHRUS, Gr.

623. *reluctator*, L.624. *nubeculatus*, Gr.

POEMENIA, Hlgr.

625. *hectica*, Gr.

PHIDIAS, Voll.

626. *aciculatus*, Voll.

TROIPISTES, Gr.

627. *nitidipennis*, Gr.

ODONTOMERUS, Gr.

628. *dentipes*, Gm.

ISCHNOCERUS, Gr.

629. *rusticus*, Frc.

XORIDES, Latr. [38]

630. *nitens*, Gr.631. *scutellaris*, Desv.

XYLONOMUS, Gr.

632. *precatorius*, Fab.633. *rusticus*, Desv.634. *irrigator*, Fab.635. *pilicornis*, Gr.636. *securicornis*, Hlgr.*Tribe.* **PIMPLIDES.**

RHYSSA, Gr. [38]

637. *persuasoria*, L.638. *curvipes*, Grav.

EPHIALTES, Schr.

639. *manifestator*, L.640. *mesocentrus*, Gr.641. *tuberculatus*, Frc.642. *heteropus*, Thms.643. *carbonarius*, Chr.644. *extensor*, Tasch. [39]645. *strobilorum*, Rtz.646. *albispiculus*, Morl.647. *ruficollis*, Desv.

PERITHOUS, Hlgr.

648. *albicinctus*, Gr.649. *mediator*, Fab.650. *varius*, Gr.651. *divinator*, Rssi.

THERONIA, Hlgr.

652. *Atalantae*, Poda. [40]

PIMPLA, Fab.

653. *roborator*, Fab.654. *ruficollis*, Gr.655. *graminellae*, Hlgr.656. *Hibernica*, Morl.657. *rufipleura*, Bign.658. *inquisitor*, Scop.659. *similis*, Bdg.660. *robusta*, Morl.661. *Taschenbergi*, Schm.662. *diluta*, Rtz.663. *melanocephala*, Gr. [41]664. *arundinator*, Fab.665. *didyma*, Gr.666. *nigriscaposa*, Thms. [42]667. *brevicornis*, Gr.

PIMPLA—*continued*.

- 668. punctiventris, Thms.
- 669. pomorum, Rtz.
- 670. ulicicida, Morl. [44]
- 671. vesicaria, Rtz. [43]
- 672. pictipes, Gr.
- 673. sagax, Htg.
- 674. calobata, Gr.
- 675. nucum, Rtz.
- 676. inanis, Schr.
- 677. detrita, Hlgr.
- 678. ventricosa, Tschek.
- 679. mandibularis, Gr.
- 680. instigator, Fab.
- 681. aethiops, Curt.
- 682. arctica, Ztt.
- 683. turionellae, L. [45]
- 684. maculator, Fab.
- 685. alternans, Gr.
- 686. epeirae, Bign.
- 687. curticauda, Kr.
- 688. brassicariae, Poda.
- 689. rufata, Gm.
- 690. oculatoria, Fab.
- 691. ornata, Gr.
- 692. ovivora, Boh.
- 693. Bridgmani, Bign.

POLYSPHINCTA, Gr.

- 694. variipes, Gr.
- 695. subrufa, Bdg.
- 696. tuberosa, Gr.
- 697. multicolor, Gr.
- 698. carbonata, Gr.
- 699. Bohemani, Hlgr.
- 700. percontatoria, Müll.
- 701. gracilis, Hlgr.

ACRODACTYLA, Hal.

- 702. madida, Hal.
- 703. degener, Hal.

SCHIZOPYGA, Gr.

- 704. podagrica, Gr.
- 705. circulator, Pz.
- 706. minuta, Gr.

COLPOMERIA, Hlgr.

- 707. quadrisculpta, Gr.

CLISTOPYGA, Gr.

- 708. incitator, Fab.
- 709. rufator, Hlgr.

LYCORINA, Hlgr.

- 710. triangulifera, Hlgr.

GLYPTA, Gr.

- 711. bicornis, Boie.
- 712. elongata, Hlgr.
- 713. monocerus, Gr.
- 714. fronticornis, Gr.
- 715. ceratites, Gr.
- 716. parvicornuta, Bdg.
- 717. genalis, Möll.
- 718. rubicunda, Bdg.
- 719. femorator, Desv.
- 720. haesitator, Gr.
- 721. trochanterata, Bdg.
- 722. vulnerator, Gr.
- 723. similis, Bdg.
- 724. filicornis, Thms.
- 725. tenuicornis, Thms.
- 726. resinanae, Htg.
- 727. teres, Gr.
- 728. punctifrons, Bdg.
- 729. pedata, Desv.
- 730. sculpturata, Gr.
- 731. incisa, Gr.
- 732. annulata, Bdg.
- 733. nigrina, Desv.
- 734. parvicaudata, Bdg.
- 735. lugubrina, Hlgr.
- 736. rufata, Bdg.

GLYPTA—*continued*.

- 737. *scalaris*, Gr.
- 738. *bifoveolata*, Gr.
- 739. *cicatricosa*, Rtz.
- 740. *evanescens*, Rtz.
- 741. *lineata*, Desv.
- 742. *ruficeps*, Desv.

Tribe. **LISSONOTIDES.**

STILBOPS, Fst.

- 743. *chrysostoma*, Gr.

ARENETRA, Hlgr.

- 744. *pilosella*, Gr.

CRYPTOPIMPLA, Tasch.

- 745. *caligata*, Gr.
- 746. *calceolata*, Gr.
- 747. *brachycentra*, Gr.
- 748. *errabunda*, Gr.
- 749. *quadrilineata*, Gr. [46]
- 750. *anomala*, Hlgr.

LISSONOTA, Gr.

- 751. *parallela*, Gr.
- 752. *lineata*, Gr.
- 753. *insignita*, Gr.
- 754. *leucogona*, Gr.
- 755. *Fletcheri*, Bdg.
- 756. *vicina*, Hlgr.
- 757. *quadrinotata*, Gr.
- 758. *linearis*, Gr.
- 759. *obsoleta*, Bdg.
- 760. *nitida*, Bdg.
- 761. *subaciculata*, Bdg.
- 762. *bellator*, Gr.
- 763. *argiola*, Gr.
- 764. *variipes*, Desv.
- 765. *cylindrator*, Vill.
- 766. *sulphurifera*, Gr.
- 767. *femorata*, Hlgr.

LISSONOTA—*continued*.

- 768. *culiciformis*, Gr.
- 769. *Halidayi*, Hlgr.
- 770. *variabilis*, Hlgr.
- 771. *rufomedia*, Bdg.
- 772. *unicincta*, Hlgr.
- 773. *trochanteralis*, Schm.
- 774. *deversor*, Gr.
- 775. *carbonaria*, Hlgr.
- 776. *transversa*, Bdg.
- 777. *variicoxa*, Thms.
- 778. *segmentator*, Fab.
- 779. *distincta*, Bdg.
- 780. *nigridens*, Thms.
- 781. *errabunda*, Hlgr.
- 782. *dubia*, Hlgr.

MENISCUS, Schd.

- 783. *setosus*, Frc.
- 784. *catenator*, Pz.
- 785. *nitidus*, Gr. [47]
- 786. *sulcator*, Morl.
- 787. *pimplator*, Ztt.
- 788. *impressor*, Gr.

ALLOPLASTA, Fst. [48]

- 789. *murina*, Gr.
- 790. *plantaria*, Gr.

PHYTODIAETUS, Gr.

- 791. *polyzonias*, Forst.
- 792. *coryphaeus*, Gr.
- 793. *ornatus*, Desv.
- 794. *geniculatus*, Thms.
- 795. *obscurus*, Desv.
- 796. *astutus*, Gr.

SYZEUCTUS, Fst.

- 797. *maculatorius*, Fab.
- 798. *irrisorius*, Rssi.
- 799. *bicornis*, Gr. [49]

PROCINETUS, Fst.

800. decimator, Gr.

LAMPRONOTA, Hal.

801. caligata, Gr.

802. melancholica, Gr.

803. accusator, Fab.

Tribe. **ACAENITIDES.****ACAENITUS**, Latr.

804. arator, Rssi.

805. dubitator, Pz.

COLLYRIA, Schd.

806. calcitrator, Gr.

807. puncticeps, Thms.

COLEOCENTRUS, Gr.

808. croceicornis, Gr.

AROTES, Gr.

809. albicinctus, Gr.

OEDEMATOPSIS, Tsch.

810. scabricula, Gr.

811. Ops, Morl. [50]

DIADAGMA, Morl.

812. anomala, Morl.

THYMARIS, Fst.

813. pulchricornis, Brsch.

814. fenestralis, Morl.

815. fasciata, Bdg.

APHANORRHOPTRUM, Fst.

816. ruficornis, Gr.

Tribe. **BANCHIDES.****BANCHUS**, Fab.

817. variegator, Fab.

818. pictus, Fab.

819. volutatorius, L.

820. moniliatus, Gr.

821. falcator, Fab.

EXETASTES, Gr. [51]

822. cinctipes, Retz.

823. nigripes, Gr.

824. guttatorius, Gr.

825. femorator, Desv.

826. laevigator, Vill.

827. aethiops, Gr.

828. fornicator, Fab.

829. calobatus, Gr.

830. maurus, Desv.

TRYPHONINAE.*Tribe.* **METOPIIDES.****METOPIUS**, Pz.

831. dentatus, Fab.

832. micratorius, Fab.

833. fuscipennis, Wsm.

834. dissectorius, Pz.

835. peltator, Marsh.

Tribe. **SPHINCTIDES.****SPHINCTUS**, Gr.

836. serotinus, Gr.

Tribe. **EXOCHIDES.***Sub-tribe.* **Exochini.****COLPOTROCHIA**, Hlgr.

837. elegantula, Schr.

CHORINAEUS, Hlgr.

838. cristator, Gr.

839. funebris, Gr.

840. flavipes, Bdg.

841. longicornis, Thms.

842. tricarinatus, Hlgr.

843. talpa, Hal.

HYPERACMUS, Hlgr.

844. crassicornis, Gr.

MICROLEPTES, Gr.

845. splendidulus, Gr.

POLYCLISTUS, Fst.

846. femoralis, Frc.

847. mansuetor, Gr.

848. flavipes, Rtz.

PERIOPE, Hal.

849. auscultator, Hal.

EXOCHUS, Gr.

850. podagricus, Gr.

851. pallidipes, Hlmgr.

852. nitidifrons, Thms.

853. Globulipes, Desv.

854. longicalcar, Thms.

855. congener, Hlgr.

856. curator, Fab. [52]

857. aethiops, Gr.

858. lativentris, Thms.

859. antiquus, Hal.

860. niger, Bdg.

861. squalidus, Hlgr.

862. gravipes, Gr.

863. gravis, Gr.

864. Britannicus, Morl.

865. prosopius, Gr.

866. intermedius, Morl.

867. nigripalpis, Thms.

868. flavomarginatus, Hlgr.

869. pictus, Hlgr.

870. erythronotus, Gr.

871. decoratus, Hlgr.

872. alpinus, Ztt.

873. notatus, Hlgr.

874. lentipes, Gr.

875. tibialis, Hlgr.

EXOCHUS—*continued*.

876. Fletcheri, Bdg.

877. parvispina, Thms.

878. septentrionalis, Hlgr.

879. albicinctus, Hlgr.

| *Sub-tribe. Orthocentrini.*

ORTHOCENTRUS, Gr.

880. stigmaticus, Hlgr.

881. corrugatus, Hlgr.

882. marginatus, Hlgr.

883. frontator, Ztt.

884. sannio, Hlgr.

885. monilicornis, Thms.

886. asper, Gr. [53]

887. attenuatus, Hlgr.

888. petiolaris, Thms.

889. fulvipes, Gr.

890. radialis, Thms.

891. protuberans, Hlgr.

PICROSTIGEUS, Th.

892. anomalus, Hlgr.

STENOMACRUS, Th.

893. flaviceps, Gr.

894. caudatus, Hlgr.

895. incisus, Gr.

896. curvicaudatus, Brsch.

897. concinnus, Hlgr.

898. deletus, Thms.

899. laricis, Hal.

900. ridibundus, Gr.

901. ventralis, Hlgr.

902. agilis, Hlgr.

903. confinis, Hlgr.

904. intermedius, Hlgr.

905. cognatus, Hlgr.

906. exerens, Thms.

907. affinis, Ztt.

908. pusillus, Ztt.

STENOMACRUS—*continued*.

- 909. binotatus, Hlgr.
- 910. cubiceps, Thms.
- 911. silvaticus, Hlgr.

Tribe. **BASSIDES.****BASSUS**, Fall.

- 912. laetatorius, Fab.
- 913. tricinctus, Gr.
- 914. multicolor, Gr.
- 915. albosignatus, Gr.
- 916. varicoxa, Thms.
- 917. annulatus, Gr.

HOMOCIDUS, Morl.

- 918. cinctus, Gr.
- 919. bizonarius, Gr.
- 920. obscuripes, Hlgr.
- 921. pectoratorius, Gr.
- 922. caudatus, Thms.
- 923. punctiventris, Thms.
- 924. biguttatus, Gr.
- 925. abdominator, Bdg.
- 926. flavolineatus, Gr.
- 927. tarsatorius, Pz.
- 928. fissorius, Gr.
- 929. ornatus, Gr.
- 930. deplanatus, Gr.
- 931. niger, Morl.
- 932. Sundevalli, Hlgr.
- 933. dimidiatus, Schr.
- 934. pictus, Gr.
- 935. incisus, Thms.
- 936. reflexus, Morl.
- 937. crassicus, Thms.
- 938. longiventris, Thms.
- 939. strigator, Fab.
- 940. xanthaspis, Thms.
- 941. emarginatus, Morl.

HOMOCIDUS—*continued*.

- 942. elegans, Gr.
- 943. pallidipes, Gr.
- 944. pulcher, Hlgr.
- 945. signatus, Gr.
- 946. hygrobis, Thms.

ZOOTREPHUS, Th.

- 947. rufiventris, Gr.

PROMETHUS, Th.

- 948. sulcator, Gr.
- 949. albicoxis, Thms.
- 950. scutellaris, Bdg.
- 951. Dodsi, Morl.
- 952. cognatus, Hlgr.
- 953. laticarpus, Thms.
- 954. pulchellus, Hlgr.
- 955. dorsalis, Hlgr.
- 956. festivus, Fab.

PTHORIMUS, Fst. [⁴²]

- 957. compressus, Desv.

TRICHOMASTIX, Voll.

- 958. flavipes, Hlgr.

Tribe. **TRYPHONIDES.***Sub-tribe.* **Tryphonini.****LABROSSYTA**, Fst.

- 959. scotoptera, Gr.

SPHECOPHAGA, Westw.

- 960. vesparum, Curt.

PROTARCHUS, Fst.

- 961. rufus, Gr.

MESOLEIUS, Hlgr.

962. *virgultorum*, Gr.
 963. *ustulatus*, Desv.
 964. *sepulchralis*, Hlgr.
 965. *colon*, Gr.
 966. *pini*, Bdg.
 967. *brachyacanthus*, Parf.
 968. *vepretorum*, Gr.
 969. *semicaligatus*, Gr.
 970. *fallax*, Hlgr.
 971. *erythrocerus*, Gr.
 972. *rufolabris*, Ztt.
 973. *bicolor*, Gr.
 974. *tenthredinis*, Morl. [54]
 975. *rufonotatus*, Hlgr.
 976. *nigricollis*, Gr.
 977. *dorsalis*, Gr.
 978. *elegans*, Parf.
 979. *hamulus*, Gr.
 980. *ignavus*, Hlgr.
 981. *tenuiventris*, Hlgr.
 982. *armillatorius*, Gr.
 983. *scapularis*, Ste.
 984. *molestus*, Hlgr.
 985. *aulicus*, Gr.
 986. *axillaris*, Ste.
 987. *caligatus*, Gr.
 988. *variegatus*, Jur.
 989. *segmentator*, Hlgr.
 990. *haematodes*, Gr.
 991. *maculicollis*, Ste.
 992. *sternoxanthus*, Gr.
 993. *dubius*, Hlgr.
 994. *furax*, Hlgr.
 995. *opticus*, Gr.
 996. *formosus*, Gr.
 997. *caninae*, Bdg.
 998. *filicornis*, Hlgr.
 999. *pyriformis*, Rtz.
 1000. *multicolor*, Gr.

MESOLEIUS—*continued*.

1001. *niger*, Gr.
 1002. *renovatus*, Morl.
 1003. *compressiusculus*, Th.

DYSPETES, Fst.

1004. *praerogator*, L.

TREMATOPYGUS, Hlgr.

1005. *lativentris*, Hlgr.
 1006. *albipes*, Gr.
 1007. *vellicans*, Gr.
 1008. *erythropalpus*, Gm.
 1009. *atratus*, Hlgr.

TRYPHON, Fall.

1010. *elongator*, Fab.
 1011. *brachyacanthus*, Gm.
 1012. *helophilus*, Gr.
 1013. *exclamationis*, Gr.
 1014. *ephippium*, Hlgr.
 1015. *rutilator*, L.
 1016. *trochanteratus*, Hlgr.
 1017. *vulgaris*, Hlgr.
 1018. *signator*, Gr.
 1019. *nigripes*, Hlgr.
 1020. *consobrinus*, Hlgr.
 1021. *brunneiventris*, Gr.
 1022. *compunctor*, Gr.

OTOBLASTUS, Fst.

1023. *luteomarginatus*, Gr.

Sub-tribe. Cteniseini.

EXYSTON, Schd.

1024. *cinctulum*, Gr.
 1025. *brevipetiolatum*, Th.
 1026. *subnitidum*, Gr.

ACROTOMUS, Hlgr.

- 1027. alacer, Gr.
- 1028. ridibundus, Gr.
- 1029. lucidulus, Gr.
- 1030. laticeps, Gr.
- 1031. sexcinctus, Gr.
- 1032. succinctus, Gr.
- 1033. mesoleptoides, Ste.

SMICROPLECTRUS, Th.

- 1034. jucundus, Hlgr.
- 1035. quinquecinctus, Gr.

DIABORUS, Fst.

- 1036. lituratorius, L.

EXENTERUS, Htg.

- 1037. Curtisi, Hal.
- 1038. elegans, Ste.
- 1039. marginatorius, Fab.
- 1040. gnathoxanthus, Gr.
- 1041. pachysoma, Ste.
- 1042. phaeorrhoeus, Hal.
- 1043. pictus, Gr.
- 1044. basalis, Ste.
- 1045. flavilabris, Hlgr.
- 1046. aurifluus, Hal.
- 1047. hostilis, Hlgr.
- 1048. exstirpatorius, Hlgr.
- 1049. limbatellus, Hlgr.
- 1050. mitigosus, Gr.
- 1051. lineola, Ste.
- 1052. bimaculatus, Hlgr.

TRICAMPTUS, Fst.

- 1053. apiarius, Gr.

Sub-Tribe. **Mesoleptini.**

MESOLEPTUS, Gr.

- 1054. indefessus, Gr.
- 1055. bipunctatus, Gr.
- 1056. paludicola, Hlgr.
- 1057. typhae, Frc.
- 1058. villosulus, Thms.
- 1059. fugax, Gr.
- 1060. xanthostigma, Gr.
- 1061. vulneratus, Ztt.
- 1062. testaceus, Fab.
- 1063. ruficornis, Gr.
- 1064. attenuatus, Bdgr.
- 1065. cingulatus, Gr.
- 1066. prosoleucus, Gr.
- 1067. leptocerus, Gr.
- 1068. macrodactylus, Hlgr.
- 1069. sordidus, Gr.
- 1070. glacialis, Woldst.

PERISPUDUS, Th.

- 1071. sulphuratus, Gr.
- 1072. facialis, Gr.

CATOGLYPTUS, Hlgr.

- 1073. fortipes, Gr.
- 1074. antilope, Gr.
- 1075. delusor, L.
- 1076. fuscicornis, Gm.

EURYPROCTUS, Hlgr.

- 1077. annulatus, Gr.
- 1078. nemoralis, Frc.
- 1079. alpinus, Hlgr.
- 1080. mundus, Gr.
- 1081. geniculosus, Gr.
- 1082. defectivus, Gr.
- 1083. atomator, Müll.

EURYPROCTUS—*continued*.

- 1084. chrysostomus, Gr.
- 1085. nigriceps, Gr.
- 1086. minutus, Bdg.
- 1087. albopictus, Gr.
- 1088. xanthostomus, Gr.
- 1089. lateralis, Gr.
- 1090. notatus, Gr.

NOTOPYGUS, Hlgr.

- 1091. emarginatus, Hlgr.

PERILISSUS, Hlgr.

- 1092. filicornis, Gr.
- 1093. lutescens, Hlgr.
- 1094. rufoniger, Gr.
- 1095. pallidus, Gr.
- 1096. spilonotus, Ste.
- 1097. orbitalis, Gr.
- 1098. triangulatus, Bdg.
- 1099. naevius, Gm.
- 1100. erythrocerus, Gr.
- 1101. buccinator, Hlgr.
- 1102. luteolator, Gr.
- 1103. pictilis, Hlgr.
- 1104. minutus, Bdg.

ECLYTUS, Hlgr.

- 1105. ornatus, Hlgr.
- 1106. fontinalis, Hlgr.

Sub-tribe. Ctenopelmini.

CTENOPELMA, Hlgr.

- 1107. mesoxantha, Gr.
- 1108. xanthostigma, Hlgr.
- 1109. nigra, Hlgr.

SCOLOBATES, Gr.

- 1110. auriculatus, Fab.

TACHYPORTHUS, Fst.

- 1111. italicus, Gr.

PRIONOPODA, Hlgr.

- 1112. stictica, Fab.
- 1113. xanthopsana, Gr.
- 1114. glabra, Bdg.

LATHROLESTUS, Th.

- 1115. macropygus, Hlgr.
- 1116. bipunctatus, Bdg.
- 1117. marginatus, Thms.
- 1118. unguularis, Thms.

EUCEROS, Gr.

- 1119. crassicornis, Gr.
- 1120. serricornis, Hal.
- 1121. unifasciatus, Voll.
- 1122. albiditarsis, Curt.

MONOBLASTUS, Htg.

- 1123. Neustriae, Schr.
- 1124. palustris, Hlgr.
- 1125. exstirpatorius, Gr.
- 1126. chrysopus, Gm.
- 1127. longicornis, Hlgr.

POLYBLASTUS, Htg.

- 1128. annulicornis, Gir.
- 1129. parvulus, Gr.
- 1130. Bridgmani, Parf.
- 1131. unicinctus, Bdg.
- 1132. variitarsus, Gr.
- 1133. cothurnatus, Gr.
- 1134. sphaerocephalus, Gr.
- 1135. pastoralis, Gr.
- 1136. pratensis, Gr.
- 1137. rivalis, Hlgr.
- 1138. marginatus, Hlgr.

POLYBLASTUS—*continued*.

- 1139. pinguis, Gr.
- 1140. Westringi, Hlgr.
- 1141. sanguinatorius, Rtz.
- 1142. Wahlbergi, Hlgr.
- 1143. subalpinus, Hlgr.
- 1144. melanostigmus, Hlgr.
- 1145. pyramidatus, Hlgr.
- 1146. bidentatus, Ste.

ERROMENUS, Hlgr.

- 1147. calcator, Müll.
- 1148. plebejus, Woldst.
- 1149. brunnicans, Gr.
- 1150. zonarius, Gr.
- 1151. punctulatus, Hlgr.

ERROMENUS—*continued*.

- 1152. frenator, Gr.
- 1153. analis, Brsch.
- 1154. fasciatus, Gr.

GRYPOCENTRUS, Rthe.

- 1155. cinctellus, Rthe.
- 1156. incisulus, Rthe.
- 1157. albipes, Rthe.
- 1158. anomalus, Brsch.

ADELOGNATHUS, Hlgr.

- 1159. pallidipes, Gr.
- 1160. chrysopygus, Gr.
- 1161. brevicornis, Hlgr.
- 1162. dorsalis, Gr.

OPHIONINAE.

Tribe. PLECTISCIDES.

HOLOMERISTUS, Fst.

- 1163. tenuicinctus, Fst.

PLECTISCUS, Gr.

- 1164. collaris, Gr.
- 1165. eury stigma, Th.
- 1166. tener, Fst.
- 1167. canaliculatus, Fst.
- 1168. terebrator, Fst.
- 1169. melanocerus, Fst.
- 1170. communis, Fst.

APERILEPTUS, Fst.

- 1171. albipalpus, Gr.

PROCLITIS, Fst.

- 1172. praetor, Hal.
- 1173. socius, Hal.
- 1174. comes, Hal.
- 1175. paganus, Hal.

EUSTERINX, Fst.

- 1176. obscurella, Fst.

MEGASTYLUS, Schd.

- 1177. cruentator, Schd.
- 1178. conformis, Fst.

DICOLUS, Fst.

- 1179. pectoralis, Fst.
- 1180. subtiliventris, Fst.
- 1181. insectator, Fst.

HELICTES, Hal.

- 1182. erythrostomus, Gm.
- 1183. mediator, Schd.
- 1184. borealis, Hlgr.
- 1185. varius, Hal.

MIOMERIS, Fst.

- 1186. aquisgranensis, Fst.

Tribe. **PORIZONIDES.****PORIZON**, Fall.

- 1187. exhaustator, Fab.
- 1188. dissimilis, Gr.
- 1189. gravipes, Gr.
- 1190. angustipennis, Hlgr.
- 1191. claviventris, Gr.
- 1192. harpurus, Schr.

DIAPARSUS, Th.

- 1193. geminus, Hlgr.
- 1194. versutus, Hlgr.
- 1195. erythrostomus, Gr.
- 1196. nutritor, Fab.
- 1197. gilvipes, Gr.
- 1198. rufipes, Hlgr.
- 1199. microcephalus, Gr.

THERSILOCHUS, Hlgr.

- 1200. melanarius, Hlgr.
- 1201. boops, Gr.
- 1202. nigrutilus, Gr.
- 1203. minutus, Bdg.
- 1204. nitidus, Bdg.
- 1205. morionellus, Hlgr.
- 1206. triangularis, Gr.
- 1207. rufiventris, Brsch.
- 1208. truncorum, Hlgr.
- 1209. marginatus, Bdg.
- 1210. jocator, Fab.
- 1211. carinatus, Bdg.
- 1212. Orchesiae, Morl.
- 1213. moderator, Hlgr.
- 1214. saltator, Fab.

Tribe. **CREMASTIDES.****CREMASTUS**, Gr.

- 1215. geminus, Gr.
- 1216. bellicosus, Gr.

CREMASTUS—*continued.*

- 1217. spectator, Gr.
- 1218. pungens, Gr.
- 1219. decoratus, Gr.
- 1220. interruptor, Gr.
- 1221. infirmus, Gr.

Tribe. **CAMPOPLEGIDES.****CHAROPS**, Hlgr.

- 1222. decipiens, Gr.

CAMPOPLEX, Gr.

- 1223. carinifrons, Hlgr.
- 1224. rugulosus, Fst.
- 1225. rugifer, Fst.
- 1226. falcator, Fab.
- 1227. oblitteratus, Hlgr.
- 1228. oxyacanthae, Boie.
- 1229. angustatus, Th.
- 1230. terebrator, Fst.
- 1231. nitidulator, Hlgr.
- 1232. myrtillus, Desv.
- 1233. femorator, Bdg.
- 1234. cultrator, Gr.
- 1235. pugillator, Linn.
- 1236. foveolatus, Fst.
- 1237. xenocamptus, Fst.
- 1238. anceps, Hlgr.
- 1239. confusus, Fst.
- 1240. lapponicus, Hlgr.
- 1241. bucculentus, Hlgr.
- 1242. punctatus, Bdg.
- 1243. juvenilis, Fst.
- 1244. costulatus, Bdg.
- 1245. leptogaster, Hlgr.
- 1246. incompletus, Bdg.
- 1247. erythrogaster, Fst.
- 1248. monozonus, Fst.
- 1249. obreptans, Fst.

CAMPOPLEX—*continued*.

- 1250. *disclusus*, Fst.
- 1251. *zonellus*, Fst.
- 1252. *sobolicida*, Fst.
- 1253. *tenuis*, Fst.
- 1254. *Mariae*, Schm.

SAGARITIS, Hlgr.

- 1255. *brachycera*, Th.
- 1256. *agilis*, Hlgr.
- 1257. *declinator*, Gr.
- 1258. *femoralis*, Gr.
- 1259. *raptor*, Ztt.
- 1260. *Holmgreni*, Tsch.
- 1261. *postica*, Bdg.
- 1262. *punctata*, Bdg.
- 1263. *erythropus*, Th.
- 1264. *maculipes*, Tsch.
- 1265. *zonata*, Gr.
- 1266. *latrator*, Gr.
- 1267. *incisa*, Bdg.
- 1268. *annulata*, Gr.

CYMODUSA, Hlgr.

- 1269. *cruentata*, Gr.
- 1270. *leucocera*, Hlgr.
- 1271. *exilis*, Hlgr.
- 1272. *antennator*, Hlgr.

CASINARIA, Hlgr.

- 1273. *vidua*, Gr.
- 1274. *orbitalis*, Gr.
- 1275. *morianella*, Hlgr.
- 1276. *pallidipes*, Brsh.
- 1277. *claviventris*, Hlgr.
- 1278. *moesta*, Gr.
- 1279. *ischnogaster*, Th.

LIMNERIUM, Ashm. [55]

- 1280. *albidum*, Gm.
- 1281. *geniculatum*, Gr.
- 1282. *annulator*, Ztt.
- 1283. *rufifemur*, Th.
- 1284. *xanthostoma*, Gr.

- 1285. *deficiens*, Gr.
- 1286. *arvense*, Gr.
- 1287. *Paniscus*, Gr.
- 1288. *alienatum*, Gr.
- 1289. *monticolanum*, Bdg.
- 1290. *renominatum*, Morl.

PYRACMON, Hlgr.

- 1291. *obscuripes*, Hlgr.
- 1292. *montanus*, Htg.

CANIDIELLA, Ashm.

- 1293. *tristis*, Gr.
- 1294. *subcincta*, Gr.
- 1295. *exigua*, Gr.
- 1296. *trechantella*, Th.
- 1297. *innulator*, Gr.

NEPIESTA, Th.

- 1298. *aberrans*, Gr.

NEMERITIS, Hlgr.

- 1299. *transfuga*, Gr.
- 1300. *cremastoides*, Hlgr.
- 1301. *rufipes*, Bdg.
- 1302. *sordida*, Gr.
- 1303. *gracilis*, Gr.
- 1304. *lativentris*, Th.
- 1305. *canescens*, Gr.

PHOBOCAMPA, Th.

- 1306. crassiuscula, Gr.
- 1307. unicincta, Gr.
- 1308. bicingulata, Gr.
- 1309. obscurella, Hlgr.

SPUDASTICA, Th.

- 1310. Kriechbaumeri, Bdg.

ECPHOROPSIS, Ashm.

- 1311. Viennensis, Gr.
- 1312. fuscipes, Hlgr.
- 1313. affinis, Parf.

OMORGA, Th.

- 1314. mutabilis, Hlgr.
- 1315. Faunus, Hlgr.
- 1316. molesta, Gr.
- 1317. difformis, Gm.
- 1318. ramidula, Brsh.
- 1319. ovata, Brsh.
- 1320. borealis, Ztt.
- 1321. cursitans, Hlgr.
- 1322. lugubrina, Hlgr.
- 1323. melanosticta, Gr.
- 1324. ensator, Gr.
- 1325. tumidula, Gr.
- 1326. multicincta, Gr.
- 1327. fasciata, Bdg.

LATHROPLEX, Th.

- 1328. infernalis, Gr.

GONOTYPA, Th.

- 1329. melanostoma, Th.

NEPIERA, Th.

- 1330. concinna, Hlgr.
- 1331. clypeata, Brsh.

TRANOSEMA, Th.

- 1332. robusta, Woldst.
- 1333. pedella, Hlgr.

OLESICAMPA, Th.

- 1334. auctor, Gr.
- 1335. gracilipes, Th.
- 1336. fulviventris, Gm.
- 1337. binotata, Th.
- 1338. longipes, Müll.
- 1339. pagana, Hlgr.
- 1340. nigroplica, Th.
- 1341. simplex, Th.
- 1342. sericea, Hlgr.

MELOBORIS, Hlgr.

- 1343. dorsalis, Gr.
- 1344. stagnalis, Hlgr.
- 1345. inculcator, Gr.
- 1346. rufiventris, Gr.
- 1347. litoralis, Hlgr.
- 1348. ischnocera, Th.
- 1349. crassicornis, Gr.

PECTENEILLA, Morl.

- 1350. latungula, Th.

ANGITIA, Hlgr.

- 1351. insectator, Schr.
- 1352. parvula, Gr.
- 1353. annulicrus, Th.
- 1354. coleophorarum, Rtz.
- 1355. alternans, Gr.
- 1356. ruficornis, Bdg.
- 1357. nana, Gr.
- 1358. Elishae, Bdg.
- 1359. annulipes, Bdg.
- 1360. croceipes, Msh.
- 1361. pusio, Hlgr.

ANGITIA—*continued*.

- 1362. crassa, Bdg.
- 1363. sordipes, Th.
- 1364. aculeata, Bdg.
- 1365. apostata, Gr.
- 1366. rufipes, Gr.
- 1367. claripennis, Th.
- 1368. majalis, Gr.
- 1369. albonotata, Bdg.
- 1370. fenestralis, Hlgr.
- 1371. chrysosticta, Gr.
- 1372. lateralis, Gr.
- 1373. cerophaga, Gr.
- 1374. cylindrica, Brsh.
- 1375. armillata, Gr.
- 1376. tibialis, Gr.
- 1377. virginalis, Gr.
- 1378. gracilis, Bdg.
- 1379. vestigialis, Rtz.
- 1380. curvicauda, Hlgr.
- 1381. rufata, Bdg.
- 1382. interrupta, Hlgr.
- 1383. exareolata, Rtz.
- 1384. reticulata, Bdg.
- 1385. Fitchi, Bdg.
- 1386. combinata, Hlgr.
- 1387. variabilis, Bdg.
- 1388. tripunctata, Bdg.

ANILASTA, Th.

- 1389. braccata, Gm.
- 1390. rapax, Gr.
- 1391. notata, Gr.
- 1392. ebenina, Gr.
- 1393. carbonaria, Rtz.
- 1394. ruficincta, Gr.
- 1395. Barretti, Bdg.
- 1396. dolosa, Gr.
- 1397. caedator, Gr.

ANILASTA—*continued*.

- 1398. rufa, Bdg.
- 1399. tricineta, Hlgr.
- 1400. clausa, Brsh.
- 1401. inquinata, Hlgr.
- 1402. coxalis, Brsh.
- 1403. placida, Desv.
- 1404. Brischei, Bdg.

HOLOCREMNA, Th.

- 1405. incrassator, Hlgr.
- 1406. clandestina, Hlgr.
- 1407. erythropyga, Hlgr.
- 1408. argentata, Gr.
- 1409. pubescens, Rtz.

Tribe. PRISTOMERIDES.

PRISTOMERUS, Curt.

- 1410. vulnerator, Pz.

Tribe. ANOMALIDES.

SCHIZOLOMA, Wsm.

- 1411. amicta, Fab.
- 1412. capitata, Desv.

EXOCHILUM, Wsm.

- 1413. circumflexum, Linn.
- 1414. brevicorne, Gr.

HETEROPELMA, Wsm.

- 1415. calcator, Wsm.

TRICHOMMA, Wsm.

- 1416. enecator, Rssi.
- 1417. fulvidens, Wsm.

ERIGORGUS, Fst.

- 1418. perspicillator, Gr.
- 1419. insidiator, Fst.

ERIGORGUS—*continued*.

- 1420. *carinatus*, Brsh.
- 1421. *fibulator*, Gr.
- 1422. *Heros*, Wsm.
- 1423. *melanobatus*, Gr.

ANOMALON, Jur.

- 1424. *latro*, Schr.
- 1425. *cerinops*, Gr.
- 1426. *procerum*, Gr.
- 1427. *biguttatum*, Gr.
- 1428. *ruficorne*, Gr.
- 1429. *xanthopus*, Schr.
- 1430. *bellicosum*, Wsm.

LABRORYCHUS, Fst.

- 1431. *nigricornis*, Wsm.
- 1432. *clandestinus*, Gr.
- 1433. *tenuicornis*, Gr.
- 1434. *debilis*, Wsm.

AGRYPON, Fst.

- 1435. *tenuitarsum*, Gr.
- 1436. *anomelas*, Gr.
- 1437. *variitarsum*, Gr.
- 1438. *nigripes*, Bdg.
- 1439. *interruptum*, Desv.
- 1440. *canaliculatum*, Hlgr.
- 1441. *minutum*, Bdg.
- 1442. *flaveolatum*, Gr.
- 1443. *septentrionale*, Hlgr.
- 1444. *anxium*, Wsm.
- 1445. *arquatum*, Gr.
- 1446. *insignis*, Fst.
- 1447. *geniculatum*, Hlgr.

GRAVENHORSTIA, Boie.

- 1448. *picta*, Boie.

Tribe. **OPHIONIDES.**

NOTOTRACHYS, Msh.

- 1449. *foliator*, Fab.

OPHION, Fab.

- 1450. *Mocsaryi*, Brns.
- 1451. *luteus*, Linn.
- 1452. *calcaratus*, Morl.
- 1453. *distans*, Th.
- 1454. *parvulus*, Kr.
- 1455. *forticornis*, Morl.
- 1456. *stigmaticus*, Morl.
- 1457. *longigena*, Th.
- 1458. *longicornis*, Brns.
- 1459. *scutellaris*, Th.
- 1460. *brevicornis*, Morl.
- 1461. *obscurus*, Fab.
- 1462. *minutus*, Kr.
- 1463. *ventricosus*, Gr.
- 1464. *marginatus*, Gr.
- 1465. *bombycivorus*, Gr.
- 1466. *undulatus*, Gr.

HENICOSPILUS, Ste.

- 1467. *repentinus*, Hlgr.
- 1468. *ramidulus*, Linn.
- 1469. *merdarius*, Gr.
- 1470. *combustus*, Gr.

Tribe. **PANISCIDES.**

OPHELTES, Hlgr.

- 1471. *glaucopterus*, Linn.

PANISCUS, Schr.

- 1472. *tarsatus*, Brsh.
- 1473. *nigricarpus*, Th.
- 1474. *virgatus*, Frc.
- 1475. *latungula*, Th.

PANISCUS—*continued*.

- 1476. cristatus, Th.
- 1477. melanurus, Th.
- 1478. testaceus, Gr.
- 1479. gracilipes, Th.
- 1480. fuscicornis, Hlgr.
- 1481. brachycerus, Th.
- 1482. cephalotes, Hlgr.

ABSVRTUS, Hlgr.

- 1483. luteus, Hlgr.

Tribe. MESOCHORIDES.

ASTIPHROMMUS, Th.

- 1484. alarius, Gr.
- 1485. dorsalis, Hlgr.
- 1486. graniger, Th.
- 1487. mandibularis, Th.
- 1488. strenuus, Hlgr.
- 1489. scutellatus, Gr.
- 1490. hamulus, Th.
- 1491. pictus, Brsh.
- 1492. tenuicornis, Th.
- 1493. plagiatus, Th.

MESOCHORUS, Gr.

- 1494. politus, Gr.
- 1495. nigripes, Rtz.
- 1496. tetricus, Hlgr.

MESOCHORUS—*continued*.

- 1497. temporalis, Th.
- 1498. fulgurans, Curt.
- 1499. pectinipes, Bdg.
- 1500. vitticollis, Hlgr.
- 1501. testaceus, Gr.
- 1502. semirufus, Hlgr.
- 1503. confusus, Hlgr.
- 1504. fuscicornis, Brsh.
- 1505. crassicornis, Th.
- 1506. thoracicus, Gr.
- 1507. sylvarum, Curt.
- 1508. dimidiatus, Hlgr.
- 1509. crassimanus, Hlgr.
- 1510. vittator, Hlgr.
- 1511. tenuiscapus, Th.
- 1512. pallidus, Brsh.
- 1513. pectoralis, Rtz.
- 1514. brevipetiolatus, Rtz.
- 1515. tachypus, Hlgr.
- 1516. anomalus, Hlgr.
- 1517. pictilis, Hlgr.
- 1518. facialis, Bdg.
- 1519. angustatus, Th.

STICTOPISTHUS, Th.

- 1520. complanatus, Hal.
- 1521. laticeps, Th.
- 1522. formosus, Bdg.
- 1523. convexicollis, Th.

Notes on Alterations in the Catalogue.

Note 1.

HOPLISMENUS MAURUS, Marsh.—*Mesostenus maurus*, Marsh. Ent. Mo. Mag. ix., 1873, p. 241, ♀; (?) *Hoplismenus cornix*, Kriech. Ann. Nat. Hofmus. Wien, v., 1890, p. 481, ♂ (cf. Ichn. Brit. i. 220, ii. 259 et Entomologist, 1910, p. 173). Probably a northern species with us; Marshall states that Heysham took the British Museum specimens "in the neighbourhood of Carlisle" and I possess it from Courten, Ireland.

HOPLISMENUS UNIGUTTATUS is omitted from our List, in which it was represented by a misnamed *Platylabus decipiens*, Wesm. (cf. Entom. 1910, p. 168).

Note 2

COELICHNEUMON BOHEMANI, Hlgr., was included in our List solely on the strength of Stephens' record of *Ichneumon designatorius*, Grav.; no such species exists in Stephens' collection and his reference must be ascribed to some other insect (Entom. 1910, p. 168).

C. ALBICILLUS, Grav., is also omitted; its inclusion rested upon similar unsatisfactory evidence, and the single example under this name in Stephens' collection proved to be a ♂ *Cratichneumon fabricator*, Fab.

Note 3

STENICHNEUMON DEFRAUDATOR and S. AFRICUS are now omitted. The latter was doubtless misnamed and is not to be found in Stephens' collection; the former was included by Marshall from Desvignes' record of *Ichneumon sedulus*, Grav., the ♂ of which is referable to *Barichneumon incubitor*, L. (Ichn. Brit. i. 90; cf. Entom. 1910, p. 168).

I have also ventured to omit S. MULTICINCTUS, for nothing has been heard of it here since 1835, and I have seen no example in the course of twenty years' study.

Note 4

STENICHNEUMON SCUTELLATOR is confirmed as British by a ♀ kindly presented to me by Mr. E. A. Butler, who captured it during 1882 at Battle in Sussex.

Note 5

ICHNEUMON MEMORATOR, Wesm.—I have been enabled to confirm this species

as indigenous (cf. Ichn. Brit. i., Addenda, p. 292 et Entom. 1910, p. 172), by an examination of Marshall's Welsh ♀, and the capture of a ♂ in Co. Mayo, recorded in Proc. R. Irish Acad. 1911, part xxiv., p. 9.

Note 6

ICHNEUMON ALBIGER, Wesm. Nouv. Mém. Ac. Brux. 1844, p. 56, ♀; Thoms. Ann. Soc. Fr. 1886, p. 21; O.E. xviii., 1925, ♂ ♀.—I am not yet convinced that the species referred to at Ichn. Brit. i. 138, footnote, is *de facto* this species, though it is co-specific with a so-named ♀ acquired from Schmiedeknecht. In any case *I. albiger* is wide-spread through nearly all Europe, and it is convenient to have some name for this extremely abundant British species.

Note 7

The genus PROBOLOIDES, Morl. Ichn. Brit. i., 160, is not British (cf. Entom. 1909, p. 119).

Note 8

Ctenichneumon repentinus is confirmed as British by the capture of a ♂ at Colchester by Harwood, who has generously presented me with the specimen.

Note 9

CTENICHNEUMON PLICATUS, Morl. Ichn. Brit. i. 172 (1903) = *Spilichneumon occisorius*, Fab., var. *nigrinus*, Berth. Ann. Soc. Fr. 1895, p. 646 (cf. Entom. 1910, p. 169).

Note 10

Hepiopelmus leucostigmus, Grav. (1820) = *Ichneumon maculiventris*, Desv. (1856), as shown at Entom. 1910, p. 169; consequently *Ctenichneumon caeruleator*, Zett., is not indigenous.

Note 11

Amblyteles atratorius, has been confirmed as British by Harwood, who has allowed me to examine an immaculate ♀ of the var. *indecoratus*, Berth., taken in the neighbourhood of Colchester during 1904.

Note 12

AMBLYTELES MICROCEPHALUS, Steph.; I fear this is a nom de fantaisie—cf. Ent. Mo. Mag. 1904, p. 239.

Note 13

PLATYLABUS HISTRIO, Wesm. Bull. Ac. Brux. 1855, p. 412 = *P. variipetalis*, Wesm. *lib. cit.* 1857, p. 408.—Added to the British List at Entom. 1910, p. 170.

Note 14

PLATYLABUS VOLUBILIS, Ichn. Brit. i. 233; *Cryptus volubilis*, Gr. I.E. ii. 507 = *P. orbitalis*, Gr. I.E. i. 490; Ichn. Brit. i. 229 (*cf.* Entom. 1910, p. 172).

Note 15

PHAEOGENES NITIDUS, Bridg.—During March, 1913, I examined the two males (type and co-type) of this species in Bridgman's collection, well preserved in the Norwich Museum; but I was unable to determine anything exact respecting them. They are co-specific and the metathoracic spiracles are distinctly elongate, with mesopleural sulci obsolete. I believe them to belong to the genus *Platylabus*, but am not sufficiently assured to at present move them from the position assigned them by Bridgman. Thomson's label is erroneous.

Note 16

NOTOSEMUS ALBIBUCCUS, Kriech.—The example referred to by me at Ichn. Brit. i., Addenda, p. 293 is a true representative of this species, which must consequently be added to our List; I have examined Marshall's specimen (Entom. 1910, p. 170).

Note 17

Cf. the excellent Table of all the brachypterous British CRYPTINAE (Ent. Rec. 1908, p. 34) by Ernest A. Elliott, F.Z.S.

Note 18

CRATOCRYPTUS TARSATUS, Bridg. (1881); Ichn. Brit. ii. 17 = *Plectocryptus pectoralis*, Thoms. Opusc. Ent. xxi. (1896), 2383. It belongs to the latter genus.

Note 19

Cf. Prof. Habermehl's "Revision of the Cryptid genera CRATOCRYPTUS Thoms. and CUBOCEPHALUS Ratzb., with special reference to some types of Gravenhorst and Thomson" (Deut. Ent. Zeit. 1911, pp. 611-631).

Note 20

CUBOCEPHALUS BREVICORNIS, Tasch.—I have seen a British ♀, taken at Cadder Wilderness (*cf.* Ann. Scot. Nat. Hist.

1907, p. 91), and have myself captured the species in Suffolk, thus confirming its indigenous occurrence.

Note 21

I have examined a Scots ♂ of *Microcryptus sericans* from Peter Cameron's collection, confirming the species as British.

Note 22

APTEROPHYGAS PARADOXUS, Bridg.—Mr. Ernest Elliott writes: "This species cannot belong to *Cremnoides*, Fst., because the areola is not obsolete, the costa is not moved up nearly to the base of the metathorax, and the petiolar area, being only equal in size to the metanotum, does not occupy nearly the whole upper surface of the metathorax." We must, then, restore the generic name *Apterophygus* to the list.

Note 23

Glyphicnemis.—*Cf.* Prof. Habermehl's "Revision der Cryptiden-Gattung *Stylocryptus* C. G. Thoms. unter Berücksichtigung Gravenhorstscher und Thomsonscher Typen" (Deut. Ent. Zeit. 1912, pp. 165-190). The ♂ table at p. 171 is defective.

Note 24

Phygadeuon ambiguus, Grav.—Designes' examples proved to be *Microcryptus abductor* and Bignell's pair wrongly named (Entom. 1910, p. 172). Col. Nurse has, however, confirmed the species as British (*lib. cit.* p. 314, where read *P. ambiguus* for *Chilosia grossa* in my note) by breeding it in Suffolk from a Syrphid Dipteron.

Note 25

HEMITELES RUFULUS, Thoms.—A ♀ of this species was captured by Alfred Beaumont at Chobham in Surrey, and subsequently presented to me by Chitty; it was correctly named for the former by Dr. Sigismund Brauns, who doubtless communicated the fact (*cf.* Ichn. Brit. ii. 117) to Schmiedeknecht.

Note 26

Four females of *HEMITELES SOLUTUS*, Thoms., have been kindly determined by Dr. A. Roman of Upsala, and this species is now added to our List; they were taken about Shere in Surrey by Dr. Capron; beaten by me from *Picea excelsa* on 24th October, 1899, in Bentley Woods, and swept from reeds on

23rd September, 1900, in Easton Broad on the Suffolk coast. For a note on *H. melanopygus*, Gav., cf. Entom. 1910, p. 172.

Note 27

Cecidonomus gallicola, Bridg. (1880). Dr. Roman also informs me that he considers *Hemiteles longisetosus*, Schm. Term. Füz. xx. (1897), pp. 111 et 514, probably to be synonymous with Bridgman's species.

Note 28

PEZOMACHUS ROTUNDIVENTRIS, Först. Wieg. Arch. xvi, 1850, p. 129, ♀.—This exclusively German species was added to the British List by Elliott (Entom. 1910, p. 173) on the strength of a ♀ from Marshall's collection in the British Museum, captured at Deal in Kent.

Note 29

Roman writes "I have a correspondent in Helsingfors in Finland, who this summer reared some 10,000 pupae of *Hyponomeuta padi*, Zell., and got 6,000 parasites. Among the commoner was *Pezomachus corruptor*, Fst., in both sexes. The ♂ is dimorphic, with long or punctiform wings. Both had a black thorax, and the former one is *HEMIMACHUS* (*PEZOMACHUS*) *HYPONOMEUTAE*, Bridg.," which consequently falls (cf. Ent. Tidskr. 1911, p. 202).

I also now know the ♂ of *Pezomachus fasciatus* to be dimorphic, for Mr. G. T. Lyle bred one with minutely punctiform wings (? *P. subtilis*, Fst.) along with three quite typical ♀♀ in the New Forest during 1908 from a single nest of *Agroeca brunnea*, Bl., the common spider from which Marshall (E.M.M. 1872, p. 181) raised the usual macropterous male.

Note 30

Thaumatotypus Billupsi, Bridg. 1882 = *T. Evertsi*, Burgst, Tijds. v. Ent. 1912, p. 152.

Note 31

PHRUDUS MONILICORNIS belongs to the *Stilpnides* (cf. Ich. Brit. iv, 268).

Note 32

ATRACODES VESTALIS, Hal. (1839) must fall to *A. (Polyrhembia) tenebri-cosus*, Grav. (1829), which is now proved to be synonymous (cf. Roman, Nat. Unt. Sarek. Ich. 1909, p. 222).

Note 33

ATRACODES ALBOVINCTUS, Hal., stands. *Tryphon subrufus*, Grav. = *T. consobrinus*, Hlgr., teste Pfankuch (cf. Ich. Brit. iv. 252).

Note 34

CALLIDIOTES LURIDATOR, Grav. *Ichneumon luridator*, Gr. Mem. Ac. Sc. Torin. 1820, p. 379, ♀ = *Mesoleptus coxator*, Gr. I.E. ii. 1829, 109, ♂ = *Callidiotes coxator*, Thoms. O.E. ix. 910 = *Atractodes properator*, Hal. = *MESATRACODES PROPERATOR*, Morl. Ich. Brit. ii. 258. I see no valid reason to transfer to the Tryphoninae this common species, to the cumbrous synonymy of which Prof. Habermehl has recently added (Deut. Ent. Zeit. 1910, p. 38).

Note 35

Mesostenus transfuga, Grav. I.E. ii. 752; *Stenaraeus transfuga*, Thoms. O.E. xxi. 2381.—Re-introduced as British (E.M.M. 1907, p. 273; cf. Desv. Cat. 62 et Ich. Brit. ii. p. xiv.), mixed with *Pycnocryptus peregrinator* by Stephens and erroneously synonymised with *M. ALBINOTATUS* by Marshall. I have seen it from Milford Haven (Entom. 1910, p. 173), Poyntzpass in Armagh during 1912 (in coll. Rev. F. W. Johnson), Plymouth in June, 1907 (ex coll. Chitty) and taken it in the Isle of Wight.

Note 36

Aritranis spp.—Cf. Alb. Ulbricht in Deut. Ent. Zeit. 1909, p. 782.

Note 37

DEMOPHORUS has hitherto been regarded as an Ophionid genus, unknown in Britain. I have shown (Ich. Brit. v.) that it is certainly referable to the Cryptides and that it occurs in Surrey.

Note 38

XORIDES ALBITARSUS and RHYSSA LEUCOGRAPHIA are now omitted, as erroneously recorded from Britain (Entom. 1910, p. 174).

Note 39

EPHIALTES EXTENSOR, Tasch. (Zeits Ges. Nat. 1863, p. 255) was added to the British List on account of a ♀ taken by Dr. E. A. Cockayne, ovipositing in a larva of *Sesia cynipaeformis* in Kensington Gardens during September, 1908 (Journ. Linn. Soc. Zool. xxx, 1909, p. 27; cf. also Entom. 1909, p. 136).

Note 40

Theronia Atalantæ is confirmed as British at Entom. 1909, p. 65.

Note 41

PIMPLA WITH NEW NAME.—The British species described by me (Ichn. Brit. iii., p. 69—*nec* p. 68) is distinct from *Pimpla melanocephala*, Grav., of which we know but a single unlocalised female from Stephens' collection. I have described the indigenous species (Revision of the Ichneumonidae, vol. iii., p. 85) as new under the name *Epiurus culpator*.

Note 42

PHTHORIMUS ANOMALUS (Trans. Ent. Soc. 1905, p. 420) is said by Dr. Roman to agree with the type of *Epiurus nigrescens*, Thoms. (O. E. viii. 755 *et* xiii. 1414), and I entirely concur with this synonymy, as far as one is able to judge from Thomson's very short diagnoses; I have again examined the former and find the mandibular structure to be apically bifid, not as in *Bassides* trifold.

Note 43

PIMPLA GALLICOLA, Morl. Ichn. Brit. iii. 78 (1908) = *P. vesicaria*, Ratz. Ichn. d. Forst. i. 115 (1844), ii. 90, iii. 96. Mr. Smits van Burgst, who has recently bred this species from the same host about Breda in Holland during May and June (*cf.* Tijds. v. Ent. 1911, p. 10), has been so good as to call my attention to this obvious synonymy.

Note 44

PIMPLA ULICICIDA, Morl. (Entom. 1911, p. 161, ♂ ♀) was bred from gorse flowers in the New Forest, along with the Cecidomyid *Aspondylia ulicis*, by Mr. G. T. Lyle.

Note 45

It is quite useless to any longer pretend to regard PIMPLA EXAMINATOR, Fab., as distinct from *P. turionellæ*, and I have recently (Fauna of India, Ichneumons, 1913, p. 163) sunk it as no more than a slight colourational variety.

Note 46

Cryptopimpla quadrilincata, Grav.—Unfortunately *Tryphon quadrilincatus*, Gr. (I.E. ii. 320; Ste. Illus. M. vii. 263) is described a dozen pages before the same author's *PHYTODIETUS BLANDUS*; consequently, the latter name must fall.

Note 47

Meniscus nitidus, Grav.—Here again Herr Pfankuch tells us (Zeits. Hym.-Dip. 1906, p. 17 *et* 1907, p. 155) that the earlier pagination of *Tryphon nitidus*, Gr. (I.E. ii. 134; Ste. Illus. M. vii. 233), ♂, gives it priority over LISSONOTA AGNATA.

LISSONOTA FRONTALIS, Desv. (*et* Morl. Ichn. Brit. iii. 215), of which I have examined the type in Mus. Brit., is a typical male of *M. nitidus*.

Note 48

I have pointed out (Fauna of India, Ichneumons, 1913, p. 222) that *Alloplasta*, Fst., of 1868, had already been re-described (*cf.* Ichn. Brit. iii. 226), without either the author's or my knowledge, by Peter Cameron under the name *Trichopimpla* (Zeits. Hym.-Dip. 1903, p. 303); it is, consequently, now convenient to adopt it.

The insect recorded by Desvignes (Cat. 68) from Britain under the name *Phytodietus corvinus* (*cf.* Ichn. Brit. iii. 240, footnote) is still in his collection in Mus. Brit. and proves to be *Alloplasta plantaria*, Gr., ♂.

Note 49

Syzeuctus (Diceratops) bicornis is confirmed as British by Mr. W. H. Tuck, who captured a fine ♂ (kindly presented to me) on 16th July, 1901, near Bury St. Edmunds in Suffolk.

Note 50

Oedematopsis Ops, Morl.—*Cf.* Mr. Rupert Stenton's confirmation of its occurrence in Surrey by the capture of several females (Entom. 1910, p. 294) at Wimbledon Common.

Note 51

EXETASTES GRACILICORNIS, Grav., is now omitted from our List. The single pair in Brit. Mus. (*cf.* Ichn. Brit. iii. 306) is from Stephens' collection and nothing but the variety (I expect correctly considered a good species by Pfankuch) *illusor* of *E. nigripes*. *E. aethiops* is still retained, though its claims to be considered indigenous are hardly stronger. *E. crassus* is not British, and was found to be distinct from *E. laevigator* by Herr Pfankuch in his valuable paper upon the Gravenhorstian types of this genus (Jahr. Ver. Ins. Breslau, 1912). *E. cinctipes* is probably the parasite figured by Albin

in 1720, plate xxvii., emerging from its own cocoon, bred from *Hadena pisi*, in England.

Note 52

Pfankuch finds, upon examining Gravenhorst's types, that *Exochus curvator*, Fab., is synonymous with *TRICLISTUS SPIRACULARIS*, Thoms., which must be sunk.

Note 53

CHORINAEUS ASPER, Grav., proves upon examination by the same excellent critic (*Deut. Ent. Zeit.*, 1913, p. 180) to be identical with *Orthocentrus discolor*, Hlgr. et Thoms. (O.E. 2425); this is the specimen captured by Hope in Shropshire before 1829. *Chorinacus talpa*, Hal., is consequently our only small species of that genus.

Note 54

MESOLEIUS TENTHREDINIS, Morl. Bull. Ent. v, Agric. Canada, 1912, p. 26.—This is the species, that I at first thought might be—I was most careful not to state actually was—*M. aulicus*, so commonly bred from the sawfly *Holcocneme Erichsoni*, Htg., both in Cumberland and Ottawa (cf. *Ichn. Brit.* iv. 157, footnote). The copy of the description that I sent for the Transactions to the Entomological Society was not deemed worthy of publication.

Note 55

Only the first five species of *Limnerium* belong to that genus, as now restricted; the remaining six at present simply stand there, for lack of a more definitely ascertained position.

C. M.

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